MOSBY'S HANDBOOK OF

Herbs & Natural Supplements

FOURTH EDITION

LINDA SKIDMORE-ROTH

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Mosby's Handbook of Herbs & Natural Supplements

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Mosby's Handbook of

FOURTH EDITION

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BREASTFEEDING CATEGORIES

Category 1A	No data available.
Category 2A	Compatible with breastfeeding.
Category 3A	Compatible with breastfeeding but use caution.
Category 4A	Strongly discouraged in breastfeeding.
Category 5A	Contraindicated in breastfeeding.

HERBAL CLASSIFICATION

The American Herbal Products Association (AHPA) created a rating system that classifies herbal products according to their relative safety and potential toxicity based on the following four categories:

Class 1 Herbs that can be consumed safely when used appropriately.

Class 2 Herbs for which the following use restrictions apply, unless otherwise directed by an expert qualified in the use of the described substance:

- **2a** For external use only.
- **2b** Not to be used during pregnancy.
- **2c** Not to be used while nursing.
- **2d** Other specific use restrictions as noted.

Class 3 Herbs for which significant data exist to recommend the following labeling: "To be used only under the supervision of an expert qualified in the appropriate use of this substance." Labeling must include proper use information as follows: dosage, contraindications, potential adverse effects and drug interactions, and any other relevant information related to the safe use of the substance.

Class 4 Herbs for which insufficient data are available for classification.

From the American Herbal Products Association: *Botanical Safety Handbook,* Boca Raton, Fla, 1997, CRC Press.

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PREFACE

It is estimated that almost half of all health care consumers in the United States take some form of herbal or natural product supplement alone or in combination with conventional medicines. Yet the therapeutic value of many of these products is unproven. Additionally, some products may interact with prescription medications, and some products may be harmful to clients with certain conditions. Of perhaps even greater concern is the fact that the majority of clients who use alternative medicines never mention their use to their health care providers.

Because of the prevalence of the use of herbal products, health care professionals need access to reliable, unbiased information about herbs and other alternative medicines. *Mosby's Handbook of Herbs & Natural Supplements*, fourth edition, does not advocate for or against the use of herbal products and other natural supplements. Rather, this book acknowledges the widespread use of these types of remedies with the goal of providing health care professionals with current, reliable, unbiased information with which to advise clients on the responsible and intelligent use of herbal products as a part of their overall health treatment and maintenance plan.

This book contains detailed monographs of 300 herbs and natural supplements, appendixes filled with key information, a glossary, and a comprehensive index, all designed to be easy to use and to provide the depth of information today's health care professionals demand.

Herbal Monographs

Mosby's Handbook of Herbs & Natural Supplements provides the user with an essential reference that allows easy access to extensive information on 300 herbal and natural supplements. A unique feature of this handbook is the consistent format, which allows for quick reference without sacrificing the depth of detail necessary for a thorough understanding of the material presented. The following information is provided whenever possible:

Common Name. Each herb or supplement is arranged alphabetically by the most common name, in natural order. Hence, black hellebore is located within the Bs and white cohosh within the Ws.

Scientific Name. The scientific, or botanical, name immediately follows the common name whenever applicable. The scientific name provides positive identification for various species or substances that might share a common name. Occasionally, more than one species is listed when various herbs are chemically similar. Gentian, for example, has two scientific names: *Gentiana lutea* and *Gentiana acaulis.*

Other Common Names. Most herbs and natural supplements are known by a variety of additional names. The most common of these are listed here and in the index of the book to aid the user in locating and identifying particular herbs or natural supplements.

Origin. This section briefly states the origins of each herb or supplement.

Uses. This section explains the uses for which the remedy is known or has been known in the past. Included in the section wherever possible is Investigational Uses, a category that provides information on current research and possible new uses for a variety of herbs and supplements.

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Actions. In this section of the monograph, the actions of the herb or supplement are explained, together with any research or studies performed.

Product Availability. The common available forms and plant parts used are listed in this section of the monograph, followed by dosages. Whenever possible, the dosages are divided by use; age group, including specific pediatric and geriatric doses; and any limiting conditions, such as renal impairment or pregnancy. Because of great variance in reported dosages, references are cited whenever possible.

Contraindications. This section includes classification systems and an explanation of situations in which a particular herb or supplement should not be used. This information may also include warnings for specific groups of people based on lack of research in a particular area. The first classification system is from the Australian Therapeutic Goods Administration. While this system is recommended for drugs, it is also appropriate for herbs because it allows for individual analysis of herbs in pregnancy. The second classification system is used for breastfeeding. Both of these systems classify only a select group of herbs and focus solely on pregnancy and breastfeeding. The third classification system, which has been used in past editions, is from the American Herbal Products Association (AHPA). The AHPA assigns a safety rating to many of the herbs and supplements in use today. These ratings are broken into four main classes with several subclasses, and usually identify specific plant parts or forms of each herb. Detailed descriptions of all three of these classifications can be found in the beginning of the book.

Side Effects/Adverse Reactions. Side effects and adverse reactions are broken down by body system. Any life-threatening side effects are underlined and in bold, italic type, making them easy to find.

Interactions. The interactions are conveniently broken into four categories—drug, herb, food, and lab test interactions—making it quick and easy to look for particular types of interactions.

Pharmacology. Pharmacokinetics for various herbs and natural supplements, including information on peak, half-life, binding, and excretion, are covered here. Immediately following the pharmacokinetic information is a table of Chemical Components and Possible Actions. This table lists the potentially active chemical constituents for each herb and any possible actions those components might have.

Client Considerations. Client considerations are based loosely on the nursing process and are organized into Assess, Administer, and Teach Client/Family categories. Considerations are consistently organized under these headings to highlight information in a format convenient for client care.

Icons. Throughout the monographs, certain icons are used to highlight key information. The Alert icon calls out key information regarding toxicity, dangerous interactions, and other significant reactions that may threaten a client's health. The Popular Herb icon is used to show that an herb has been designated by the Herbal Research Foundation as an herb in common use in the United States. The Pregnancy icon identifies information of special interest to pregnant or lactating clients. The Pediatric icon highlights information for pediatric clients.

Appendixes

Herb Resources. This appendix contains a list of herbal resources located on the Internet, including key organizations, not-for-profit research agencies, and additional educational resources.

Herb/Drug Interactions. This table is a single, handy resource for reviewing all known drug interactions for the herbs and supplements listed in this book.

Pediatric Herbal Use. This extensive appendix covers current pediatric herbal use and research.

Abbreviations. This alphabetical list explains the meanings of abbreviations found in this book.

References

Each monograph has been individually referenced, with detailed references listed at the end of the book.

Glossary

The glossary explains the special vocabulary of herbal medicine. Terms such as *tincture, infusion, extract,* and *decoction* are defined clearly and succinctly.

Index

The comprehensive index allows the user to look up each herb by any of its common or scientific names, as well as by any of the conditions it may be used to treat. That is, the reader can use the index to find a comprehensive list of herbs used in the treatment of cancer, HIV, or other conditions.

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A

Acidophilus

(a-suh-dah'fuh-lus)

Scientific name: *Lactobacillus acidophilus,* alone or combined with *Lactobacillus bulgaricus*

Other common names: Acidophilus milk, Bacid, Kala, Lactinex, Lactobacillus GG, MoreDophilus, Probiata, Probiotics, Superdophilus, yogurt

Origin: Acidophilus is commercially prepared.

Uses

Acidophilus is used to increase the normal flora in the gastrointestinal tract in uncomplicated diarrhea, antibiotic-induced diarrhea, *Clostridium difficile* diarrhea, to treat or prevent vaginal candida infections with or without antibiotics, and to treat bacterial and other candida and urinary tract infections. *Lactobacillus acidophilus* may decrease *Campylobacter pylori,* and some *Lactobacillus* spp. may decrease lipoprotein concentrations. Yogurt is used topically to treat thrush in the infant. Acidophilus may be effective for atopic dermatitis (eczema), atopic disease, *Helicobacter pylori* infections, irritable bowel syndrome, and respiratory infections (Jellin et al, 2008). Acidophilus is used for the treatment of diarrhea in children. In adults it is used for hepatic encephalopathy, high cholesterol, and necrotizing enterocolitis prevention, although research has been inconclusive.

Investigational Uses

Preliminary research is exploring the use of *Lactobacillus* to stimulate nonspecific immunity (Miettinen et al, 1996) and to prevent recurrent superficial bladder cancer (Aso et al, 1995), proliferation of breast cancer (Biffi et al, 1997), colonic preneoplastic lesions (Rao et al, 1999), and inhibition of *H. pylori* (Lorca et al, 2001; Gotteland et al, 2006; Shimizu et al, 2002). Studies have shown a decrease in growth of *Gardnerella vaginalis* (Aroutcheva et al, 2001) and rotavirus positive and negative status in children with acute diarrhea (Lee et al, 2001).

Actions

Replenishment of Normal Bacterial Flora and Suppression of Bacterial Infection

Lactobacillus is part of the normal flora living in the gastrointestinal tract. It acts by competing for nutrients with other organisms such as *Candida,* thus preventing the other organism from reproducing and flourishing to infection. Most people obtain sufficient quantities of *Lactobacillus* by including dairy products such as milk and yogurt in their diet. *Lactobacillus* is also responsible for assisting in the digestion and absorption of several vitamins, including the fat-soluble vitamins and proteins. Research shows that *Lactobacillus* GG promotes local antigen-specific immune responses in the immunoglobulin A (IgA) class, protects the body from invasive pathogens, prevents cell membrane permeability defects, and controls the absorption of antigens (Majamaa et al, 1997). This supplement also inhibits the growth of vaginal microorganisms such as *Escherichia coli, Candida albicans,* and *G. vaginalis* (Hughes et al, 1990).

Treatment of Diarrhea in Children

Several studies in children have shown mixed results when acidophilus is used for diarrhea. However, use of *L. acidophilus* is gaining popularity in use for diarrhea (Van Niel et al, 2002).

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Treatment of Clostridium difficile *Diarrhea*

Research shows that *Lactobacillus* GG is a reliable alternative to antibiotic therapy for relapsing *C. difficile* diarrhea (Bennett, 1996). Of the 32 patients included in this study, all reported improved symptoms and 84% were cured with a single treatment. Because *Lactobacillus* remains in the gastrointestinal tract longer than other bacteria, it is useful for treating a variety of gastrointestinal conditions.

Hypocholesteremic Action

It is believed that *Lactobacillus* decreases cholesterol by assimilating it. However, one study showed no improvement in cholesterol levels when subjects took *Lactobacillus* four times a day for 21 days (Lin et al, 1989). The fact that this study used a strain of *Lactobacillus* other than *L. acidophilus* could account for the differing results.

Other Possible Actions

A few other studies have investigated the potential role of *Lactobacillus* in preventing recurrent superficial bladder cancer (Aso et al, 1995), increasing the production of tumor necrosis factor-alpha (TNF-alpha), increasing interleukin-6 and interleukin-10, and inducing nonspecific immunity (Miettinen et al, 1996). The consumption of *Lactobacillus* has been shown to decrease enzymes in the colon that may play a role in causing cancer (Marteau et al, 1990). However, research has not yet confirmed this hypothesis. Also, use of *Lactobacillus* has been shown to decrease *H. pylori* in vitro by acid production and low pH (Lorca et al, 2001).

Product Availability

The following forms contain added cultures of 500 million to 10 billion organisms: capsules, dairy products (acidophilus milk, yogurt), granules, powder, tablets, vaginal suppositories, liquid, chewable tablets.

Dosages

Dosage information is for replenishment of normal bacterial flora and suppression of bacterial infection. No dosage information is available for other uses.

- Adult PO: 1-10 billion organisms (or an amount of product containing the equivalent) divided tid-qid
- Adult vaginal suppository: insert one suppository (1 billion) in vaginal fornix nightly × 7 days

Clostridium difficile

- Adult PO: 1.25 billion live *Lactobacillus* GG in two divided doses for 2 weeks
- Child PO: 5-10 billion live *Lactobacillus* GG in rehydrating solution
- Infant topical: apply yogurt in mouth to treat oral thrush

Contraindications

Dairy products are not recommended for use by lactose-sensitive individuals. Acidophilus-containing products may be used during pregnancy and lactation and may be given to children >3 yr. Do not give in the presence of high fever.

Side Effects/Adverse Reactions

This product is well tolerated by most individuals.

GI: Flatus

SYST: Severe infections, bacteremia (immunocompromised patients) (Griffiths et al, 1992; Sussman et al, 1986)

Interactions

Drug

Antacids: Antacids should be taken 30-60 min before acidophilus.
Antibiotics: Acidophilus should not be used concurrently with antibiotics. Separate by at least 2 hours.
Azulfidine: Acidophilus may reduce the effect of azulfidine.
Immunosuppressants *(cyclosporine, tacrolimus, azathioprine),* ***antineoplastics:*** Acidophilus should not be used concurrently with immunosuppressants or antineoplastics.
Warfarin: Acidophilus may decrease warfarin action; use together cautiously.

Herb

Garlic: Acidophilus may decrease the absorption of garlic. If taken concurrently; separate the dosages by 3 hours.

Client Considerations

Assess

Replenishment of Normal Bacterial Flora/Suppression of Bacterial Infection

- Assess for recent antibiotic use if candida infection is present vaginally or if thrush is identified. Provide a list of dairy products that contain *Lactobacillus* (e.g., acidophilus milk, yogurt).
- Assess for lactose-intolerant clients. Discourage the use of supplemental dairy products and recommend the use of *Lactobacillus* in supplement form instead.

Hypercholesteremia

- Assess the client's lipid profile: cholesterol, total triglycerides, LDL, and HDL.
- Assess the client's diet for foods high in cholesterol, LDL, and HDL.
- Assess whether the client is taking medication to treat hypercholesteremia.
- Assess for the use of garlic (see Interactions).

Administer

- Instruct the client to take acidophilus PO as a supplement, or in milk or yogurt. Take on an empty stomach in AM or 1 hour before each meal.
- Refrigerate *Lactobacillus* in supplement form to prevent spoilage. Nonrefrigerated products often are not viable by the time they are purchased. Instruct the client to continue to refrigerate supplements.
- Administer *Lactobacillus* GG to individuals with candida infections who cannot tolerate other products.

Teach Client/Family

Replenishment of Normal Bacterial Flora/Suppression of Bacterial Infection

- Instruct the client to take all antibiotics as prescribed, even if candida infection occurs.
- Teach the client about the use of *Lactobacillus* in the diet for infection prevention and maintenance. Unless contraindicated, provide information about dairy products that naturally contain *Lactobacillus.*

Hypercholesteremia

- Inform the client that acidophilus may be added to the diet without altering the medication therapy, diet, or exercise regimen.

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Aconite

(a′kuh-nite)

Scientific names: *Aconitum napellus* L., *Aconitum columbianum, Aconitum chinense, Aconitum carmichaeli*

Other common names: Aconitis tuber, autumn monkshood, blue monkshood root, blue rocket, bushi, chuan-wu, friar's cap, helmet flower, monkshood, mousebane, soldier's cap, wolfsbane

Origin: Aconite can be found in Asia, Europe, and North America.

Uses

Aconite is used primarily in Europe and Asia. Because of its extreme toxicity, many trained herbalists in the United States do not use this product. The root is the plant part used in traditional medicine. In Asia, aconite has multiple uses and is usually mixed with other herbs. Circa 1500 BC, aconite was used to make poisonous arrows. In homeopathic and Oriental medicine, aconite extract is used as a hypotensive and analgesic and to relieve cancer pain. It is also used to decrease fever and to treat arthritis, bruises, fractures, sciatica, and rheumatism. Aconite is extremely heating and therefore is used to treat cold extremities and poor digestion. Aconite is a counterirritant.

Actions

Except for toxicology studies, very little research is available on the pharmacologic actions of aconite. Most qualified herbalists use this product only after proper processing. It is commonly used in traditional Chinese medicine.

Cardiovascular Action

Cardiovascular action results from the ability of aconite to raise membrane permeability for sodium ions, thus prolonging cardiac repolarization. When minute quantities of the herb were given to rabbits intraperitoneally, severe nerve damage and damage to the myelin sheath occurred (Kim et al, 1991). This herb is considered cardiotoxic. One study (Wright, 2001) identifies the irreversible blocking of heart sodium channels by one component (lappaconitine) of the herb piconite. Another study (Gu et al, 2008) found that in rats and mice there was no significant change in cardiac hypertrophy with the use of aconite.

Stimulation of Immunity

Aconitum carmichaeli increases the secretion of interleukin-1b, tumor necrosis factor-alpha (TNF-alpha), and interleukin-6 in human mononuclear cells (Chang et al, 1994). Neither the mechanism of immune stimulation nor the exact site of action has been identified.

Analgesic and Antiinflammatory Actions

In mouse studies, aconite alkaloids have been shown to be much more potent and effective than hydrocortisone and indomethacin for reducing inflammation. Lappaconitine, an alkaloid of aconite, has been identified as a central-acting, nonopioid analgesic that decreases the pain response during both the first and second pain phases (Ono et al, 1991). In Ayurvedic medicine, aconite root generally is considered safe. However, before use the herb is processed using an elaborate detoxification method to make it safe. The level of toxicity drops significantly during such controlled processing (Mahajani et al, 1990). Another way toxicity is reduced is by cooking the root with other herbs, foods, and salt. Toxicity still occasionally occurs, but its occurrence is rare.

Product Availability

Dried root (prepared); homeopathic; liniment; tincture of dried root: 1:10, 1:20; tincture of fresh leaf: 1:2; a few Chinese forms of this herb are sold only to herbalists.

Plant Parts Used: Leaves, roots, flowers

Dosages

Use of this herb is not generally recognized as safe, and it is not found over the counter. Maximum dosage is 25 mg tid *(Aconitum napellus)*.

- Adult homeopathic preparation: 6 c-30 c strength, dilute 1 part aconite tincture to 99 parts water or alcohol, repeat 4 additional times, resulting in a 6 c potency (Jellin et al, 2008).
- Adult topical liniment: maximum 1.3%, no typical dosage

Contraindications

Class 3 herb.

Aconite should never be used during pregnancy and breastfeeding. It should not be given to children. Aconite can be absorbed through the skin if handled improperly. Because of its extreme toxicity, this herb should be administered only by a trained herbalist.

Side Effects/Adverse Reactions

The following results from moderate to high doses.

CNS: Weakness, tingling in extremities, restlessness, sweating, dizziness, reduced consciousness, coma

CV: Hypotension, bradycardia, *cardiac arrhythmias, tachyarrhythmias, death*

EENT: Blurred vision, *throat constriction*, oral numbness

GI: Nausea, vomiting, anorexia, diarrhea

META: Metabolic respiratory acidosis, hypokalemia

MS: Weakness, paresthesia

RESP: *Paralysis to respiratory tract*

Interactions

Drug

Antiarrhythmics *(beta-blockers)*, ***antihypertensives, cardiac glycosides*** *(digoxin)*: Increased toxicity and death may occur when aconite is used with these and other cardiac agents; do not use concurrently.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid	Aconitine	Paralysis of nerve endings and central nervous system; antiinflammatory; analgesic
	Yunaconitine (Lai et al, 2006)	Highly toxic
	Hypaconitine	Neuromuscular blocker
	Lappaconitine	Analgesic; irreversibly blocks heart sodium channels

Continued

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Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Alkaloid (cont'd)	Mesaconitine; Oxoaconitine; Picraconitine; Aconine; Napelline	
Acid	Malonic acid; Succinic acid; Itaconic acid; Aconitic acid	
Sugar		
Starch		
Fat		
Resin		

Client Considerations

Assess

- Assess for client use. Many other natural products have the same uses as aconite, without the extreme toxicity.
- Assess for the use of antiarrhythmics, antihypertensives, and cardiac glycosides. Toxicity and death may occur (see Interactions).

Administer

- Inform the client that aconite is not available over the counter. Only herbalists trained in the use of aconite may administer this herb.

Teach Client/Family

- Warn the client never to use aconite in children or those who are pregnant or breastfeeding.
- Because of its extreme toxicity, warn the client never to use aconite except under the direction of a qualified herbalist.
- Warn the client not to touch the aconite plant; toxicity and death can occur.

Agar

(ah'gur)

Scientific names: *Gelidium cartilagineum, Gracilaria confervoides,* and others

Other common names: Agar-agar, agarweed, Chinese gelatin, colle du japon, E406, gelose, Japanese gelatin, Japanese isinglass, layor carang, seaweed gelatin, vegetable gelatin, vegetarian gelatin

Origin: Agar is found in several species of red marine algae in oceans around the world.

Uses

Agar is used as a bulk laxative and as a treatment for neonatal hyperbilirubinemia (Vales et al, 1990). However, most naturopaths and herbalists would not use this product to treat neonatal hyperbilirubinemia. It is used in dentistry to make dental

impressions (Jellin et al, 2008). Agar is commonly found in foods and is safely and regularly used as a thickener in place of gelatin by those with gelatin sensitivity.

Actions

Laxative Action

Agar swells in the intestine, thus stimulating peristalsis and increasing bulk content in the colon. It is not broken down and therefore passes through the gastrointestinal system almost unchanged.

Hypocholesteremic Action

For many centuries in Japan, seaweed was thought to decrease atherosclerosis. In 1960, Kameda's study showed a decrease in blood pressure using *Laminaria* spp., and the following year, Kameda's results with rabbits showed a decrease in both blood pressure and cholesterol (Kameda et al, 1960, 1961). However, subsequent studies using rats were unable to duplicate these results. Several more studies have used various types of seaweed, including *Porphyra tenera,* which has been shown to decrease cholesterol levels significantly in rabbits. The anticholesterol action of agar takes place in the gut, where it interferes with the absorption of cholesterol (Fahrenbach et al, 1966).

Other Actions

Research shows the immune property and antiinfective property of agar (Fu et al, 2007). Another study (Chen et al, 2004) identified the inhibitory effects on some types of cancer cells.

Product Availability

Flakes, powder, strips

Plant Part Used: Thallus

Dosages

Bulk Laxative

- Adult PO: 4-16 g (1-2 tsp) powder mixed with fruit or 8 oz liquid, taken daily-bid; do not use dry; take with at least 8 oz of water

Contraindications

Class 2d herb.

Until more research is available, agar should not be used during pregnancy and breastfeeding and should not be given to children. Agar should not be used when coma or gastrointestinal obstruction is present. Avoid use in those with swallowing difficulties.

Side Effects/Adverse Reactions

GI: *Bowel obstruction, esophageal obstruction*
RESP: Choking, *aspiration* (if client is not alert or if insufficient liquids are given)
SYST: Decreased absorption of vitamins and minerals

Interactions

Drug

All PO drugs: Agar will cause decreased absorption of all PO drugs.
Electrolyte solutions: Agar causes dehydration when used with electrolyte solutions; do not use concurrently.

Continued

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Interactions—cont'd

Tannic acids: Agar causes dehydration when used with tannic acids; do not use concurrently.

Thyroid products: Because of the high iodine content of agar, avoid concurrent use with thyroid products.

Pharmacology

Pharmacokinetics

Very little is known about the pharmacokinetics of agar, although this herb is known to increase the excretion of cholesterol, decrease the digestion of fat, and decrease the retention of nitrogen. Gastrointestinal absorption is poor.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Calcium salt		
Sulfuric acid		
Polysaccharide	Agarose	Increases bulk in the colon
Alginic acid	Agaropectin	Hypocholesteremic

Client Considerations

Assess

- Assess the reason the client is using this product.
- Assess the client's bowel pattern and determine whether laxatives are used frequently; monitor for bowel obstruction.
- If the client is using agar for its anticholesterol action, assess the client's lipid levels: triglycerides, cholesterol, HDL, and LDL.
- Assess for the use of thyroid products; the iodine in some agar products may interfere with thyroid hormones (see Interactions).
- Assess for the use of electrolyte solutions and tannic acids (see Interactions).

Administer

- Instruct the client to take agar PO on an empty stomach to prevent improper absorption of vitamins and medications.
- Give with at least 8 oz of water, to prevent obstruction; without sufficient liquid, agar may swell and burst in the esophagus.

Teach Client/Family

- Until more research is available, caution the client not to use agar during pregnancy and breastfeeding and not to give it to children.
- Teach the client the signs and symptoms of bowel obstruction.
- Explain that vitamins and minerals may not be absorbed properly while taking agar.
- Instruct the client about lifestyle changes that prevent constipation: increased fluids, bulk in the diet, and exercise.

= Pregnancy = Pediatric = Alert = Popular Herb

Agrimony

(a′gruh-mow-nee)

Scientific names: *Agrimonia eupatoria, Agrimonia pilosa* var., *Agrimonia japonica*

Other common names: Ackerkraut, agronmonia, church steeples, cocklebur, funffing, funffinger kraut, langyacao, liverwort, longyacao, philanthropos, potter's piletabs, sticklewort, stickwort

Origin: Agrimony is grown in Asia, Europe, and the United States.

Uses

Agrimony in the form of tea or gargle is used to treat a sore throat. Agrimony may be used topically as an astringent, to help stop bleeding, and to treat cuts and abrasions. Little research exists on its use in humans. Some herbalists report that agrimony has antiasthmatic, sedative, antiinflammation, decongestant, and diuretic properties, although no scientific studies support these claims. Diuretic and uricosuric use have been reported (Giachetti et al, 1986). Most other uses are based solely on anecdotal reports. However, agrimony has been used for decades as a hemostatic to promote blood coagulation. It has been used to decrease vaginal bleeding and discharge and for urinary tract infections. Ointments made from agrimony may shrink hemorrhoids and soothe sores, insect bites, and athlete's foot. It may be used for its antibacterial action to treat vaginal trichomoniasis. Agrimony is used in combination with licorice root, fennel seed, and eyebright as an eyewash (Mills, Bone 2005).

Investigational Uses

Agrimonia pilosa is currently used in China to treat cancer (Sugi, 1997). One study (Min et al, 2001) showed an inhibitory effect against HIV-1. Another study (Venskutonis, 2007; Correia, 2007) showed activity of agrimony as a radical scavenger and antioxidant.

Actions

Most of the research on agrimony was done in the 1950s and 1960s. Very little research has been done in recent years.

Hemostatic Action

Some early studies reported that agrimony promotes blood coagulation. In one study, when *Agrimonia* was given to rabbits intravenously, platelets and calcium increased and clotting time decreased (Yao et al, 1957). However, other early studies reported that *A. pilosa* does not promote coagulation but instead increases clotting time. Even at high doses (15 mg/kg), agrimony given intravenously to rabbits had this result (Qu et al, 1957). Frogs treated with agrimony experienced elevated blood pressure and respiration, as well as increased heart rate and cardiac contractility (Wu et al, 1941). Mice treated with agrimony experienced prolonged tail bleeding time and, as a result of antiplatelet action, acute pulmonary thromboembolism (Hsu et al, 1987). This conflicting research indicates that strict controls need to be in place in order to replicate these studies.

Antiinflammatory Action

The antiinflammatory action of agrimony has been demonstrated on rabbits. In one study, when the irritated conjunctivas of rabbits were treated with agrimony, a definite decrease in inflammation occurred. This effect may have resulted

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from high levels of the tannin phlobaphere, a potent astringent in the herb (Eda, 1972).

Antibacterial Action

A study of 40 women with vaginal trichomoniasis showed that a decoction of agrimony extract inhibited the growth of gram-positive bacteria (Wang et al, 1953). When a 200% concentrated extract was applied over the vaginal wall and a cotton ball treated with the herb was inserted into the vagina for 3 to 4 hours, 37 of the women were cured with one treatment. In another study using a decoction of *Agrimonia eupatoria,* agrimony inhibited the growth of *Mycobacterium tuberculosis* (Peter-Horvath, 1965) and even destroyed streptomycin- and para-aminosalicylic-acid–resistant strains. The only strains not affected were those resistant to isoniazid.

Other Actions

One study showed that *A. pilosa* inhibited carcinoma in laboratory animals, but not in human fibroblasts (*Kampo Kenkyu,* 1979). Another study demonstrated the antitumor activity of agrimonii, one of the tannins in agrimony, on test mice (Miyamoto et al, 1985, 1988). A single dose of 10-30 mg/kg resulted in almost complete resolution of the tumor. Yet another study (Min et al, 2001) evaluated several Korean plants for anti-HIV-1 activity. *Agrimonia pilosa* showed anti-HIV-1 activity. Still another study identified antihyperglycemic insulin-releasing and insulin-like activity of agrimony (Gray, Flatt, 1998).

Product Availability

Gargle, tablets, tea, ointment, capsules, poultices, bath tonics

Plant Parts Used: Flowers, leaves, stems

Dosages

Ophthalmic

- Adult topical eyewash: 30 g/500 ml licorice root, fennel seed, eyebright, and agrimony (dilution 1:1) (Mills, Bone, 2000)

Sore Throat

- Adult PO gargle: 3 g in water/day

Other

- Adult PO tablet: 3 g daily or equivalent (Blumenthal, 1998)
- Adult PO tea: 3 tsp in 1 cup boiling water, up to 4×/day
- Adult topical: apply as poultice as needed using 10% water extract

Contraindications

Until more research is available, agrimony should not be used during pregnancy and breastfeeding, and it should not be given to children. Agrimony should not be used by persons with hypersensitivity to this plant or to roses.

Side Effects/Adverse Reactions

CV: Palpitations, flushing of the face, hypotension
GI: Upset, constipation
INTEG: Photosensitivity, photodermatitis
SYST: Hypersensitivity, rash, allergic reactions, hypoglycemia

Interactions

Drug

Anticoagulants *(warfarin, heparin):* Agrimony may decrease clotting times when used with anticoagulants; avoid concurrent use (PO) (theoretical).
Antihypertensives: Agrimony used wih antihypertensives may increase hypotension.
Antidiabetics: Agrimony may increase hypoglycemic effect; monitor blood glucose (Jellin et al, 2008).

Lab Test

Agrimony decreases glucose test; increases PT, INR, and clotting time.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Tannin	Ellagitannins	Wound healing; astringent
	Trace gallotannins	Antiinflammatory
Agrimonin	A; B; C; Pimic acid	Nonhemostatic
	Agrimonii	Antitumor
	Agrimonic acid; Pedunculagin; Casuarictin; Potentillin	
Furanocoumarin		Photosensitivity; anticoagulant
Polysaccharide		
Silic acid		
Urosolic acid		
Agrimonolide		
Flavonoid	Luteolin; apigenin	
Essential oil		
Vitamin	B_1; K; C	
Seeds Also Contain		
Acid	Oleic acid; Linoleic acid; Linolenic acid	

Client Considerations

Assess

- Assess the reason the client is using this product.
- Assess the client for hypersensitivity reactions such as rash or breathing difficulty. If such reactions are present, discontinue use of agrimony and administer antihistamines.
- Assess for the use of anticoagulants, antidiabetics, and antihypertensives (see Interactions).

Administer

- Instruct the client to take agrimony PO in tea or tablet form.
- Instruct the client to dilute the herb in warm water for use as a gargle.

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- Instruct the client to store eyewash frozen in sterile blocks, or use immediately.
- Advise the client to boil the herb for 10 minutes using low heat and apply as a poultice several times per day.

Teach Client/Family

- Until more research is available, caution the client not to use agrimony during pregnancy and breastfeeding and not to give it to children.
- Inform the client that agrimony may increase hypotension when taken with antihypertensives. It may decrease blood glucose levels when taken with antidiabetics, including insulin. Agrimony may increase the risk of bleeding when taken with anticoagulants.

Alfalfa

(al-fal′fuh)

Scientific name: *Medicago sativa* L.

Other common names: Buffalo herb, lucerne, medicago, phytoestrogen, purple medic, purple medick

Origin: Alfalfa grows throughout the world.

Uses

Alfalfa is used as a diuretic, and to increase blood clotting and to relieve inflammation of the prostate. It is also used for acute or chronic cystitis and to treat digestive disorders, including constipation and arthritis. Alfalfa seeds are made into a poultice and applied topically to treat boils and insect bites. Alfalfa is primarily used as a nutritive tonic and alkalizing herb. It is used to boost normal vitality and strength, stimulate the appetite, and help in weight gain. Alfalfa is an excellent source of beta-carotene, potassium, calcium, and iron.

Investigational Uses

Researchers are experimenting with the use of alfalfa to protect against carcinogens in the gastrointestinal tract, decrease cholesterol levels, prevent menopausal symptoms, and treat atherosclerosis.

Actions

Antiatherosclerotic Action

Several research studies have focused on the ability of alfalfa to counteract the atherosclerotic effect of dietary cholesterol. In one study, monkeys that were fed high levels of cholesterol with alfalfa added showed a decrease in cholesterolemia and plasma phospholipids. The distribution of their plasma lipoproteins also normalized, as did the extent of aortic atherosclerosis. In a subsequent study of monkeys fed semipurified food and alfalfa saponins, the monkeys showed a decrease in cholesterol levels with no change in HDL levels and an increase in fecal excretion of neutral steroids and bile (Malinow et al, 1981, 1983). Another study using rabbits showed similar results, with prevention of hypercholesteremia and atherosclerosis. Alfalfa saponins and seeds also produced similar results in rabbits (Malinow et al, 1980).

Estrogenic Action

In one study, chromatography was used to examine several types of alfalfa tablets for the presence of coumestrol, a phytoestrogen. This phytoestrogen was found in all of the alfalfa tablets studied (Elakovich et al, 1984). Alfalfa has estrogenic effects that may result from the chemical components of coumetrol, daidzein, and genisten (Jellin et al, 2008).

Product Availability

Capsules, flour, flowering tops, infusion, fluid extract (from leaves), poultice (from seeds), sprouts, tablets

Plant Parts Used: Flowers, germinating seeds, whole herb, leaves

Dosages

- Adult PO fluid extract: 5 ml tid maximum; 1-2 ml tid-qid (Smith, 1999)
- Adult PO tea: 5-10 g, steeped as a tea (Jellin et al, 2008)
- Adult PO powder: 5-300 grains (a food status)
- Adult PO capsules: 3-6 caps daily
- Adult PO seeds: 40 g heated tid (for high cholesterol)

Contraindications

Because it may act as a uterine stimulant, alfalfa should not be used during pregnancy except under the direction of a qualified herbalist. It should not be used by persons who are hypersensitive to this herb or who have lupus erythematosus. The seeds of alfalfa should not be eaten because they contain a toxic amino acid.

Side Effects/Adverse Reactions

CV: Hypotension
INTEG: Photosensitivity
SYST: Systemic lupus erythematosus (SLE)-like syndrome (from sprouts), *bleeding, blood dyscrasias*

Interactions

Drug

Anticoagulants *(heparin, warfarin):* Alfalfa may increase prothrombin time and prolong bleeding when taken with anticoagulants.
Antidiabetics *(including insulin):* Alfalfa may potentiate hypoglycemic action; use cautiously.
Estrogens, hormonal contraceptives: Alfalfa may interfere with hormone replacement therapy or hormonal contraceptives.

Herb

Black cohosh, blood root, burdock, hops, kudzu, licorice, red clover, soy, thyme, white horehound, yucca: Alfalfa increases estrogen effect.
Nettle, parsley: Alfalfa increases the risk of clotting.

Lab Test

Alfalfa decreases total cholesterol and glucose test.

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Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Caroteinoid	Lutein	Cancer prevention
Saponins	Aglycones	Antiatherosclerotic, anticholesterol
	Medicagenic acid; Hederagenin	Antifungal
Isoflavonoid	Formononetin Glycosides; Genistein; Daidzein	Estrogenic
Coumarin	Coumestrol	Estrogenic
	Lucernol; Sativol; Trifoliol	
Chlorophyll		
Minerals	Copper; Iron; Manganese; Zinc	Antidiabetic
Vitamins	A, C, D, E, K, B-Complex	
Carotene	Alpha; Beta	
Electrolytes	Calcium; Phosphorus; Potassium; Sodium; Magnesium	
Seeds Also Contain		
L-canavaine		Increased immune response
Betaine	Stachydrine	Estrogenic
	Homostachydrine	
Trigonelline		
Fatty oil		

Client Considerations

Assess

- Assess the reason the client is using this product.
- Assess for allergic reactions. If present, discontinue use of this herb and administer an antihistamine or other appropriate therapy.
- Assess for SLE-like symptoms. If these symptoms occur, determine whether the client is using alfalfa sprouts and, if so, the amount and duration of use (Malinow et al, 1982; Roberts et al, 1983). Persons with SLE should not use alfalfa seeds (Bengtsson et al, 2002).
- Assess for use of anticoagulants, antidiabetics, estrogens, contraceptives (hormonal), and other herbs (see Interactions).

Administer

- Instruct the client to take alfalfa PO as powder, tablets, capsules, fluid extract, or flowering tops, or in food as flour or sprouts.

Teach Client/Family

- Because alfalfa acts as a uterine stimulant, caution the client not to use this herb during pregnancy unless under the direction of a qualified herbalist.

- Inform the client that a SLE-like syndrome has occurred in persons using alfalfa sprouts and that alfalfa seeds should not be consumed by those with SLE because the latent disease may be reactivated (Jellin et al, 2008).
- Teach the client to report bleeding, hot flashes, lupuslike symptoms to health care provider.

Allspice

(awl'spise)

Scientific names: *Pimento officinalis, Eugenia pimenta*

Other common names: Clove pepper, Jamaica pepper, pimenta, pimento

Origin: Allspice is a tree that grows in Central America, Mexico, and the West Indies.

Uses

Allspice is used to treat indigestion, flatulence, muscle pain, and dental pain. Contemporary use is limited, and allspice is rarely used therapeutically. However, it is often used as a flavoring or aromatic spice.

Investigational Uses

Researchers are experimenting with the use of allspice as an antimicrobial and as a treatment for diabetes and hypertension.

Actions

Most of the primary research available has focused on several possible actions of *Pimenta dioica.*

Antibacterial and Antifungal Actions

One study showed that allspice is effective against yeasts and fungi (Hitokoto et al, 1980). Eugenol, one of the chemical components of allspice, may be responsible for this action.

Cardiovascular Action

One study showed that allspice acts as a hypotensive, presumably because of the ability of tannic acid to exert a depressant effect on smooth muscle and cardiac tissue. However, it is also possible that allspice extract produces a negative inotropic effect (Súarez et al, 1997). *P. dioica* has been shown to act as a central nervous system depressant, as well as a hypotensive. When aqueous extract of allspice was given to rats intravenously at doses of 30, 70, and 100 mg/kg, the larger fraction produced the greatest hypotensive effect, with no significant changes in heart rate or ECG (Súarez et al, 1997). However, further studies are needed to determine whether the substance in *P. dioica* that is responsible for the hypotensive effect is tannin or some other component. Antihyperlipidemic effects may occur with the use of allspice. One study (Shyamala, 2005) showed rats fed with a high-fat diet, then given allspice, showed marked improvement in triglyceride levels. Lee et al (2007) studied the antihistone acetyltransferase activity that is present in adrogen receptor–dependent prostate cancer. There was significant inhibition of prostate cancer cell growth with allspice.

Other Actions

Allspice may possess antioxidant properties as demonstrated by its radical scavenging activity (Yun et al, 2003). Allspice has shown insulin-like activity, improving glucose metabolism (Broadhurst et al, 2000).

Product Availability

Extract, pimento water, oil, powder

Plant Parts Used: Berries (dried, unripened, rind), powdered fruit

Dosages

Dosages vary

Indigestion/Flatulence

- Adult PO: 2 tsp powder mixed in 8 oz water bid-tid
- Adult PO: 3 drops of essential oil on sugar

Pain

- Adult topical: mix oil or powder in water to make a paste, apply prn

Contraindications

Class 1 herb.

Until more research is available, allspice should not be used therapeutically during pregnancy and breastfeeding, and it should not be given therapeutically to children. Allspice use is not recommended for use by persons with colitis, irritable bowel syndrome, Crohn's disease, diverticulitis, or cancer.

Side Effects/Adverse Reactions

CNS: Seizures (high doses), CNS depression
EENT: Irritation of mucous membranes (topical)
GI: Nausea, vomiting, gastroenteritis, anorexia
INTEG: Rash, hypersensitivity reactions (topical)

Interactions

Drug

Anticoagulants, antiplatelets: Allspice may inhibit platelets, causing bleeding (Jellin et al, 2008).
Minerals: Allspice may interfere with the absorption of minerals such as iron and zinc. Do not use concurrently with mineral supplements.

Pharmacology

Pharmacokinetics

Very little is known about the pharmacokinetics in humans. Two metabolites, homovanillic acid and homomandelic acid, have been identified.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil	Eugenol	Antifungal; antioxidant; central nervous system depressant; prostaglandic activity; digestive enzymes; antiplatelet
	Cineole, levophel andrene; palmitic acid	
	Methyleugenol; Caryophylene	Antioxidant; central nervous system depressant; prostaglandic activity; digestive enzymes
Vitamin	A; C; Thiamine; Riboflavin; Niacin	
Flavonoid	Quercetin	Antiinflammatory
Glycoside		
Sesquiterpene		
Mineral		
Tannin		Wound healing; antiinflammatory
Resin		
Sugar		
Gum		

Client Considerations

Assess

- Assess the reason the client is using this product.
- Assess the client's use of mineral supplements; allspice may interfere with their absorption (see Interactions).
- If allspice is being used to treat hypertension, assess the client's cardiac status: blood pressure, pulse, character, and edema. Also, assess for other medications the client may be taking to treat this condition.

Administer

- Instruct the client to take powder PO or use as a topical treatment.

Teach Client/Family

- Until more research is available, caution the client not to use allspice therapeutically during pregnancy and breastfeeding and not to give it therapeutically to children.
- Teach the client to limit the time that allspice is used to prevent seizures.
- Teach the client to never use >5 ml of allspice oil; toxicity may occur.

Aloe

(a′low)

Scientific names: *Aloe vera* L., *Aloe perryi, Aloe barbadensis, Aloe ferox, Aloe spicata*

Other common names: Aloe, aloe barbadensis, aloe vera, Barbados, bitter aloes, burn plant, Cape aloe, Curacao aloe, elephant's gall, hsiang-dan, lily of the desert, lu-hui, socotrine aloe, Venezuela aloe, Zanzibar aloe

Origin: Aloe is a succulent found throughout the world. It is native to Africa.

Uses

Aloe is used topically to treat minor burns, sunburn, cuts, abrasions, bedsores, diabetic ulcers, acne, and stomatitis. It is used internally as a stimulant laxative, a tonic, and to treat duodenal ulcers, renal calculi, and active bleeding ulcers. Aloe may also be used to relieve radiation burns suffered by cancer patients and may help slow the development of wrinkles.

Investigational Uses

Researchers are experimenting with the use of the leaf gel (dried juice), taken internally, as a treatment for diabetes mellitus, HIV, cancer, ulcers, colitis, irritable bowel syndrome, bleeding, asthma, and the common cold.

Actions

Aloe products have been used for centuries for a variety of purposes.

Antiinflammatory and Wound Healing Actions

The topical actions of topical aloe products are well documented. Numerous studies have demonstrated their antiinflammatory, wound-healing properties. Aloe products have been used to reduce inflammation by inactivation of bradykinin, to inhibit prostaglandin A2, to oxidize arachidonic acids, and to block thromboxane A. The wound-healing action of aloe may result from its causing increased blood flow in the affected area.

Other research demonstrates that aloe products have additional medicinal effects. One study (Hutter et al, 1996) indicates that *Aloe barbadensis,* when used topically on mice, produces effects equivalent to those of topical hydrocortisone. Tests have demonstrated the antiinflammatory activity of aloe vera gel extract when used to treat induced edema of the rat paw. The extract reduced edema and the number of neutrophils migrating into the rat's peritoneal cavity (Vazquez et al, 1996). In addition, aloe has been shown to be an effective treatment for aphthous stomatitis (Plemons et al, 1994).

Laxative Action

The laxative effects of aloe result from its ability to inhibit absorption without stimulating peristalsis (Ishii et al, 1990, 1994a, 1994b).

Antiviral Action

Aloe increases immunity by acting on cytokine. It stimulates phagocytosis in neutrophils, activates complement systems, stimulates B-lymphocytes to make a specific antibody, and also stimulates T-lymphocyte activity (Carrington Laboratories; Sheets et al, 1991). Montaner et al (1996) found that CD4 counts and P24 antigens are

not affected by acemannan, one of the polysaccharide components of aloe, at 1600 mg/day.

Antidiabetes Action

Aloe gel acts as a thromboxane inhibitor (TXA2), promotes vasodilation, and maintains homeostasis within the vascular endothelium (Heggers, 1993). Studies have shown that aloe gel reduces blood glucose levels significantly within 2 weeks, but not to normal levels (Bunyapraphatsara et al, 1996a, 1996b; Yongchaiyudha et al, 1996).

Other Possible Actions

At this time research is minimal on the use of aloe to treat asthma and peptic ulcer. However, studies are underway, and action for these disorders is possible. Aloe has also been shown to inhibit cell transformation and to be antimutagenic (Woo et al, 2002). In Davis et al (2006), no improvement was shown in irritable bowel syndrome in a group of 58 patients, and Shah (2007) reports it is best to wait until further studies have been conducted to use aloe vera for inflammatory bowel disease.

Product Availability

Available Forms

Capsules: 75, 100, 200 mg extract or powder; cream; gel: 98%, 99.5%, 99.6%; jelly; juice: 99.6%, 99.7%; tincture (1:10, 50% alcohol) shampoo and conditioner

Plant Parts Used: Large, blade-like leaf, secretory cells below leaf epidermis, roots (rarely)

Dosages

Active Bleeding Ulcer

- Adult PO juice: 1 L/day (Murray, Pizzorno, 1998)

HIV/AIDS

- Adult PO: 800-1600 mg/day (acemannan) (Pizzorno, Murray, 2006)

Laxative

- Adult PO dried juice: 50-300 mg at bedtime (*Federal Register,* 1985)
- Adult PO aloe latex extract: 100-200 mg aloe or 50 mg aloe extract at bedtime (Jellin et al, 2008)

Renal Calculi

- Adult PO dried juice: take a dose just below that of the laxative dose (Murray, Pizzorno, 1998)

Psoriasis vulgaris

- Adult topical cream: 0.5% of a 50% ethanol extract of aloe, combined with castor/mineral oil tid $\times$5 days/wk $\times$ 1 month

Genital Herpes

- Adult topical cream: 0.5% of a 50% ethanol extract of aloe, combined with castor/mineral oil tid $\times$ 5 days/wk $\times$ 2 wk

Skin Irritation/Wounds

- Adult and child PO capsules: 100-200 mg at bedtime
- Adult and child PO extract: 50-100 mg at bedtime
- Adult and child topical leaf gel: apply prn; do not use on deep wounds

Contraindications

Pregnancy category 4; breastfeeding category 3A

Aloe should not be given to children younger than 12 years of age. It should not be used by persons with kidney disease, cardiac disease, or bowel obstruction. Deaths have been reported with IV/IM injections. Aloe gel should be used cautiously in intestinal obstruction, Crohn's disease, ulcerative colitis, appendicitis, and other bowel disorders, since aloe gel could be contaminated with aloe latex (Newell et al, 1996). Aloe should not be used topically by persons who are hypersensitive to this plant, garlic, onions, tulips, or other plants of the Liliaceae family. It should not be used topically on deep wounds. Dried aloe juice is not for long-term use.

Side Effects/Adverse Reactions

GI: Spasms, *intestinal mucosa damage* (irreversible), *hemorrhagic diarrhea* (internal use of dried juice)
GU: Red-colored urine, *nephrotoxicity* (internal use of dried juice)
INTEG: Contact dermatitis, delayed healing of deep wounds (topical use)
META: Hypokalemia (frequent internal use)
Reproductive: *Uterine contractions causing spontaneous abortion, premature labor* (internal use of dried juice)

Interactions

Drug

Antiarrhythmics, antidiabetics, cardiac glycosides, loop diuretics, potassium-wasting drugs, systemic steroids, thiazides: Aloe products taken internally may increase the effects of antiarrhythmics, cardiac glycosides, antidiabetics, loop diuretics, potassium-wasting drugs, systemic steroids, and thiazides.

Herb

Jimsonweed: The action of jimsonweed is increased in cases of chronic use or abuse of aloe.
Licorice/horsetail: Licorice/horsetail may cause hypokalemia when used with aloe taken internally; avoid concurrent use.

Lab Test

Serum potassium: Aloe may lower test values with long-term aloe use.

Primary Chemical Components and Possible Actions*

Chemical Class	Individual Component	Possible Action
Vitamin	A; B group; C; E	Antioxidant; immunostimulant
Enzyme	Carboxypeptidase	Antiinflammatory; analgesic
	Bradykinase	Blocks histamine
Mineral	Magnesium lactate	
	Sodium; Potassium; Calcium; Magnesium; Manganese; Copper; Zinc; Chromium; Iron	

= Pregnancy = Pediatric = Alert = Popular Herb

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Polysaccharide (leaf, resin)	Glucomannans Acemannan	Immunomodulation Antiviral; anti-HIV
Anthraquinone (leaf, resin)	Barbaloin; Isobarbaloin; Anthrone-C glycosides	Purgative effect (large amount); aids absorption from the gastrointestinal tract (small amount)
Lignin		Penetrative ability
Saponin		Antiseptic
Salicylic acid		Antiinflammatory (internal use); keratolytic (topical use)
Amino acid		

**Aloe* spp. contain more than 75 different constituents.

Client Considerations

Assess

General Use

- Assess the reason the client is using this product.
- Assess whether the client is taking cardiac or renal medications (antidysrhythmics, cardiac glycosides, loop diuretics, antidiabetes agents, thiazide diuretics). Assess whether systemic steroids or potassium-wasting drugs are being used. Inform the client that aloe products taken internally may increase the effects of these drugs.
- Assess for the use of licorice, jimsonweed, or other herbs that contain cardiac glycosides (see Interactions).
- Assess for internal use. Caution client that dried juice aloe products taken internally can be dangerous and should be used only under the supervision of a qualified herbalist.

Antidiabetes Use

- Assess all prescription antidiabetes agents used by the client.
- Assess fasting blood glucose, 2 hours postprandial (60-100 mg/dl normal fasting level; 70-130 mg/dl normal 2 hours level).
- Assess blood and urine glucose levels during herb use to determine adequate control.
- Assess for hypoglycemia and hyperglycemia.

Laxative Use of Dried Juice Products

- Assess for repeated laxative use of aloe or traditional products.
- Assess blood and urine electrolytes if herb is used often.
- Assess for cramping, gastrointestinal spasms, and hemorrhagic diarrhea.
- Assess for cause of constipation: identify whether fluids, bulk, or exercise is lacking from lifestyle.

Skin Disorders

- Assess area to be treated with topical aloe products. Identify characteristics of burns, rashes, inflammation, and color of area. Aloe products should not be used on deep wounds; healing can be delayed.

- Assess for route of use. Caution the client not to use by injection; persons have died using this route (Anon, 1998).

Administer

- Instruct the client to use aloe internally only under the direction of a qualified herbalist. Electrolyte imbalances may occur.
- Juice of the plant can be used topically by cutting off a leaf, warming, and squeezing gel onto affected area.
- Refrigerate 100% aloe vera gel after opening.

Teach Client/Family

- Inform the client that pregnancy category is 4 and breastfeeding category is 3A.
- Caution the client not to use aloe in children younger than 12 years of age.
- Caution the client not to use aloe topically if hypersensitive to this plant, garlic, onions, or tulips.
- Caution the client not to use aloe topically on deep wounds.
- Caution the client that dried aloe juice is not for long-term use.

American Hellebore

(uh-mehr′i-kuhn heh′luh-bowr)

Scientific name: *Veratrum viride*

Other common names: False hellebore, green hellebore, Indian poke, itchweed, swamp hellebore

Origin: American hellebore is a perennial found in the United States.

Uses

American hellebore traditionally has been used as a diuretic, an antihypertensive, and to treat pneumonia, seizure disorders, and nerve pain.

Investigational Uses

Research is ongoing to determine the usefulness of American hellebore for the treatment of hypertensive crisis, myasthenia gravis, and pregnancy-induced hypertension.

Actions

Cardiovascular Action

American hellebore produces many cardiovascular effects, including reduced blood pressure and increased blood flow to the vital organs. It has been used to treat hypertensive conditions such as pregnancy-induced hypertension and hypertensive crisis (Arena et al, 1986). However, scientific evidence supporting any of the anecdotal claims for American hellebore is lacking. Because the toxic and therapeutic levels are so close, it is not a commonly used herb.

Other Actions

American hellebore historically was used in Rome to make poisonous arrows.

Product Availability

Fluid extract, powder, tincture

Plant Parts Used: Dried rhizome, roots

Dosages

Hypertensive Disorders

- Adult PO fluid extract: 1-3 minims q2hr until stabilized
- Adult PO powder: 2 grains
- Adult PO tincture: 20-30 minims

No other dosage information is available.

Contraindications

Class 3 herb (root).

American hellebore should not be used during pregnancy except under the direct supervision of a competent herbalist. Until more research is available, this herb should not be used during breastfeeding, and it should not be given to children. American hellebore should not be used by persons with hypersensitivity to it or those with cardiovascular disorders such as hypotension, cardioversion, cardiac glycoside toxicity, or pheochromocytoma.

Side Effects/Adverse Reactions

CNS: Dizziness, paresthesia, *seizures*
CV: Hypertension, hypotension, *bradycardia, arrhythmias*
EENT: Salivating, dysgeusia
GI: Nausea, vomiting, anorexia, abdominal cramps
INTEG: Hypersensitivity reactions
RESP: Shortness of breath, *respiratory depression*
Toxicity: *Nausea, vomiting, diarrhea, abdominal pain, change in vision, burning throat, coma, paralysis, dyspnea*

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid	Veratridine	Topical analgesic; parasiticide
	Verticinone (Zhou et al, 2008)	
	Veracintine	Antineoplastic
	Pseudojervine; Rubijervine; Jervine; Neogermitrine; Cevadine; Protoveratrine; Protoveratridine	Steroidlike
Resin		

Client Considerations

Assess

- Determine the reason the client is using American hellebore and suggest safer, more conventional alternatives. Because the therapeutic and toxic levels of this herb are very close, this herb is rarely used.

- Assess for hypersensitivity reactions. If present, discontinue use of this herb and administer antihistamine or other appropriate therapy.

Administer

- Instruct the client to store American hellebore products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Advise the client not to confuse American hellebore with European hellebore and pheasant's eye (Jellin et al, 2008)
- Caution the client not to use American hellebore during pregnancy except under the direct supervision of a competent herbalist. Do not give this herb to children or use during breastfeeding.
- Because the therapeutic and toxic levels are very close, advise the client to avoid using American hellebore altogether. Safer alternatives are available.

Andrographis

(an-dro′graf-iz)

Scientific name: *Andrographis paniculata*

Other common names: Bidara, carmantina, chiretta, Chuan Xin Lian, creat, fat ha lai jone, Indian echinacea, kalmegh, kariyat, kirta, sadilata, vizra ufar

Origin: Andrographis is found growing wild in India and Sri Lanka and is cultivated in many other parts of the world.

Uses

Andrographis is used for the common cold, influenza, sinusitis, HIV, snake and insect bites, colic, diabetes, diarrhea, flatulence, hepatoxicity, leprosy, venereal diseases, and tonsillitis. It also is used as a tonic, antiseptic, antipyretic, and laxative.

Actions

Angrographis may be used in the common cold to provide symptomatic relief. Most research for angrographis focuses on use in the common cold. Several studies (Caceres et al, 1999; Hancke et al, 1995; Melchior et al, 1997) with over 250 participants have focused on the reduction of the severity and duration of the common cold. Another study (Melchior et al, 2000) found that a combination of andrographis and eleutherococcus caused similar effects. These effects may be due to the immunostimulant properties.

Many diabetic patients in the Philippines have used andrographis to control blood glucose for many years. One study (Reyes et al, 2006) confirmed blood glucose control in diabetic rats. Antioxidant and antiinflammatory activities were noted in Sheeja et al (2006).

Product Availability

Caps, tincture

Plant Parts Used: Aerial parts

Dosages

Common Cold

- Adult PO dried extract: 400 mg tid

Preventing the Common Cold
- Adult PO 200 mg/day × 5 days

Fever, Sore Throat
- Adult PO 3-6 g/day

Other
- Adult PO dried aerial parts: 1.5-6 g/day
- Adult PO dried herb: 6-9 g/day as infusion
- Adult PO: 3-6 ml/day of a 1:2 liquid extract or equivalent in tablet or cap (Mills, Bone, 2005)

Contraindications
Pregnancy category 4; breastfeeding category 1A
Andrographis may be used in children. It should not be used in hypersensitivity. Do not use in gallbladder disease, bleeding disorders, hypotension, hyperacidity, and duodenal ulcers.

Side Effects/Adverse Reactions
CV: Hypotension
GI: Nausea, vomiting, GI distress
Reproductive: Infertility

Interactions
Drug
Anticoagulants, antiplatelets, antihypertensives: Andrographis may increase the effect of these drugs.
Immunosuppressants: Andrographis (long-term) may decrease the action of immunosuppressants (Mills, Bone, 2005).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Diterpenes	Andrographolide; Deoxyandrographolide, Neoandrographolide, Isoandrographolide, Bisandrographolide, Andrographiside (Chen et al, 2006)	Hepatoprotective, Antidiabetic
Flavonoids		

Client Considerations
Assess
- Assess the reason the client is using andrographis.
- Assess for the use of anticoagulants, antiplatelets, immunosuppressants, and antihypertensives. Caution the client that the effects of these drugs may be increased.

Administer
- Keep andrographis in a dry area, away from direct sunlight.

Teach Client/Family

- Inform the client that pregnancy category is 4 and breastfeeding category is 1A.
- Inform the client that andrographis may be used in children under the supervision of a qualified herbalist.
- Teach the client that andrographis should not be used in bleeding disorders, gallbladder disease, or hypotension.

Androstenediol

(an-dro-sten′di-ol)

Scientific names: 4-Androstene-3beta, 17beta-diol, 5-androstene-3beta, 17beta-diol

Other common names: 4-AD, 4-androstenediol, 5-AD, 5-androstenediol, androdiol

Uses

Androstenediol is used for weight training and recovery, and to increase testosterone production and stamina.

Actions

Androstenediol is a prohormone and a precursor of testosterone. It can be converted to the hormones estradiol, DHEA, and estrone. Androstenediol is able to decrease HDL and increase LDL (Broeder et al, 2000). There is improvement in cardiovascular function following trauma hemorrhage that may be mediated by gamma activity (Shimizu et al, 2006).

Product Availability

Tablets

Dosages

Weight Training

- Adult PO: 100 mg bid

Contraindications

Androstenediol should not be used in children or those who are pregnant, breastfeeding, hypersensitive, or have breast or prostate cancer or heart disease.

Side Effects/Adverse Reactions

ENDO: Increased endogenous testosterone, estrone, facial hair in women

Interactions

Drug

Estrogens, estridol, estrone, testosterone: Androstenediol increases the effect of estrogens, estridol, estrone, and testosterone.

Lab Test

HDL: Androstenediol can decrease HDL.

Client Considerations

Assess

- Assess the reason the client is using androstenediol.
- Identify if the client is taking testosterone or estrogens that should not be taken with this product.
- Assess if the client has breast/prostate cancer or coronary disease.

Administer

- Keep androstenediol in a dry area, away from direct sunlight.

Teach Client/Family

- Teach the client not to use androstenediol in children or those who are pregnant or breastfeeding until more research is available.

Angelica, European

Scientific names: *Angelica sinensis* (see Dong Quai); *Angelica acutiloba, Angelica archangelica, Angelica atropurpurea, Angelica dahurica, Angelica edulis, Angelica gigas, Angelica keiskei, Angelica koreana, Angelica polymorpha, Angelica pubescens, Angelica radix*

Other common names: American angelica, European angelica, garden angelica, Japanese angelica, wild angelica

Origin: Angelica is a member of the parsley family grown in Iceland and several other northern areas.

Uses

Angelica is used to treat headaches, backaches, osteoporosis, asthma, allergies, and skin disorders; to increase gastric juices for digestion and to improve circulation; and as a diuretic, an antispasmodic, and a cholagogue. It has also been used as a folk remedy to treat stomach cancer (Duke, 2003). In addition, it has been used as a mild antiseptic; as an expectorant; to ease rheumatic pains, stomach cramps, muscle spasms; and as a treatment for bronchitis.

Investigational Uses

Angelica has been shown to possess sedative and antibacterial actions. It may be effective for premature ejaculation using a multiingredient cream containing angelica.

Actions

Several possible actions dealing primarily with the calcium channel blocking action and antibacterial action of the *Angelica* spp. have been researched.

Calcium Channel Blocking Action

All coumarins in *A. archangelica* exhibit significant calcium antagonist activity, and folk medicine supports this use. According to one study, these coumarins include archangelicin, bergapten, imperatorin, isoimperatorin, isopimpinellin, osthol, ostrathol, oxypeucedanin, phellopterin, and xanthotoxin (Harmala et al, 1991, 1992). This study used 20 solvents to measure the inhibition of depolarized increased calcium uptake in rat pituitary cells. Significant hypotensive action occurred (Hikino, 1985; Yoshiro, 1985), as did negative inotropic and antiarrhythmic action (Hikino, 1985).

Sedative Action

To assess the sedative/tranquilizing effect of angelica and its antiadrenergic activity, a study was performed in which xanthotoxol was isolated from the dried root of *A. archangelica.* In all species studied (dogs, cats, rats, mice, and hamsters), a significant degree of muscle relaxation occurred while the level of consciousness remained intact. This is a critical point of difference between sedative/hypnotic agents and sedative/tranquilizing effects (Jacobsen, 1964; Turner, 1965). Thus, there is real potential for the use of angelica as a sedative or minor tranquilizer (Sethi et al, 1992). Both Japanese and Chinese angelica (see Dong Quai, pages 234-237) have shown pain-relieving and mild tranquilizing effects in animals (Hikino, 1985; Tanka et al, 1977; Yoshiro, 1985).

Premature Ejaculation

Applying the multiingredient cream to the glans penis 1 hr before intercourse, and washing off just before intercourse, showed improved delay in ejaculation (Choi et al, 2000).

Other Actions

Angelica may play an indirect role in preventing tumors through increased TNF-alpha production by macrophages. One study (Yang et al, 2004) identified the role angelica polysaccharides play in inducing the release of peritoneal macrophages.

Product Availability

Drops, fluid extract, tincture, whole herb, capsules, liniment

Plant Parts Used: Fruit, roots (used by most herbalists), seeds, whole herb, leaves

Dosages

Counterirritant

- Adult topical essential oil: dilute and apply 10-15 drops to inflamed areas (Blumenthal, 1998)

Other

- Adult PO dried root: 1-2 g tid (Pizzorno, Murray, 2006); 4.5 g/day (Jellin et al, 2008)
- Adult PO dried root infusion: 1-2 g tid (Pizzorno, Murray, 2006)
- Adult PO fluid extract: 0.5-2 ml tid (1:1 dilution) (Murray, Pizzorno, 2006)
- Adult PO tincture: 1-3 ml tid (1:5 dilution) (Moore, 1996)

GI Problems/Stimulate the Appetite

- Children PO tincture: 1.5 g of 1.5 g/ml
- Children PO fluid extract: 1.5-3 g of 1:1 g/ml

Contraindications

Class 2b/2d herb.

Angelica should not be used during pregnancy because it can induce miscarriage. Also, avoid use in breastfeeding. Persons with diabetes (angelica can increase blood glucose), peptic ulcers, or bleeding disorders should use this herb cautiously.

Side Effects/Adverse Reactions

CV: Hypotension
GI: Anorexia, flatulence, spasms of the gastrointestinal tract, dyspepsia
GU: Cream: skin irritation, erectile dysfunction
INTEG: Photosensitivity, *phototoxicity*, photodermatitis
SYST: *Bleeding may occur when used with anticoagulants*

Interactions

Drug

Antacids, H_2-blockers *(cimetidine, famotidine, nizatidine, ranitidine);* ***proton pump inhibitors*** *(lansoprazole, omeprazole, esomeprazole, pantoprazole, rabeprazole):* Angelica may increase stomach acid, which may decrease the antacid, H_2-blocker action (Jellin et al, 2008).

Anticoagulants *(heparin, warfarin),* ***antiplatelets:*** Many *Angelica* spp. increase prothrombin time and prolong bleeding when taken with anticoagulants. Avoid the concurrent use of angelica with all anticoagulants.

Doxazosin: Angelica may increase the effect of doxazosin.

Tolbutamide: *Angelica dahurica* may delay elimination of tolbutamide (Ishihara et al, 2000). Avoid the concurrent use of angelica with tolbutamide.

Herb

Anise, arnica, bogbean, boldo, capsicum, celery, chamomile, clove, dansben, fenugreek, feverfew, garlic, ginger, ginkgo, Panax ginseng, horse chestnut, horseradish, licorice, meadowsweet, prickly ash, onion, papain, passionflower, poplar, red clover, tumeric, willow: Avoid concurrent use; it may pose risk of bleeding (Jellin et al, 2008).

Lab Test

Plasma partial thromboplastin time (PTT): Angelica may increase PTT in clients taking warfarin concurrently.

Prothrombin time and plasma International Normalized Ratio: Angelica may increase test values in clients taking warfarin concurrently.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Coumarin	Osthol; Xanthotoxin	Antiinflammatory; analgesic; photosensitivity
	Xanthotoxol Angelicin; Bergapten; Imperatorin; Oreoselone; Oxypeucedanin; Umbelliferone; Xanthotoxol; Angelol I, H, Methoxycoumarin, Scopoletin (Kwon et al, 2002); Decursinol; Peucedanone	
Angelica archangelica *contains:*		
Terpene hydrocarbon		

Continued

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Alcohol		
Ester		
Lactone	Alpha-angelica	Increases calcium binding
Aliphatic carbonyl		
Polysaccharide		
Flavonoid		
Palmitic acid		
Volatile oil	Alpha-phellandrene; beta-phellandrene	Flavor/scent; inhibits contraction of ileal muscles; inhibition of uterine smooth muscle (Du et al, 2005)

Client Considerations

Assess

- Assess the reason the client is using this product.
- Assess for diabetes, bleeding disorders, or use of anticoagulants, antacids, H_2 blockers, proton pump inhibitors (see Interactions). Angelica should be used cautiously by clients with these conditions.

Administer

- Instruct the client to take angelica PO as a tincture or fluid extract, or in whole herb form. Many products require dilution. Tinctures should be taken with liquids. Essential oil requires dilution before use.

Teach Client/Family

- Advise the client not to use angelica during pregnancy. *Angelica archangelica* may be given to children.
- Inform the client that sunburn may occur. Advise the client to use sunscreen and protective clothing to prevent burns (Blumenthal, 1998).
- Teach the client not to store angelica in plastic because reaction with the essential oil may occur.

Anise

(an'us)

Scientific name: *Pimpinella anisum*

Other common names: Aniseed, sweet cumin

Origin: Anise is an annual grown throughout the world.

Uses

Anise is used internally as an expectorant to treat bronchiectasis, bronchitis, emphysema, and whooping cough. It is also used internally as an antibacterial, an antispasmodic, an abortifacient (large quantities), a diaphoretic, a diuretic, a stimulant, and a tonic. Anise can be used by steam inhalation with tea tree, pine, and chamomile to treat acute and chronic sinusitis. It is used externally to treat catarrhs of the respiratory system (asthma, bronchitis). Other reported uses include treatment for cancer, cholera, colic, dysmenorrhea, amenorrhea, epilepsy, indigestion, insomnia, lice, migraine, nausea, neuralgia, rash, scabies, and to improve breastfeeding (Duke, 2003). Anise is used as a fragrance and flavoring in food. It may be given to children to reduce gas, colic, and respiratory symptoms (Romm, 2003).

Actions

Antibacterial Action

One study identifies the inhibition of gram-positive and gram-negative organisms. Another study shows the inhibition of the mycotoxin of *Aspergillus.*

Other Actions

Anise is used for a variety of purposes. It has been used topically (bergapten, one of the chemical components, has been isolated) in conjunction with ultraviolet light to treat psoriasis (Newell et al, 1996). Anise oil mixed with sassafras oil is used as an insect repellent (Chandler et al, 1984), and anise oil may be applied topically to treat lice and scabies (Chevallier, 1996). In addition, one study has shown that the essential oil of *Pimpinella anisum* exerts an anticonvulsant effect in mice. In this study the essential oil not only suppressed induced tonic convulsions, but it also increased the threshold of clonic convulsions (Pourgholami et al, 1999). Anise also acts as a catecholamine similar to adrenalin and possesses estrogenic properties (Albert-Puleo, 1980). One study has shown the ability of this herb to block inflammation, carcinogenesis, possibly due to tumor necrosis factor–mediated signaling (Chainy et al, 2000). Another study (Boskabady et al, 2001) has identified the relaxant effects of *Pimpinella anisum,* including bronchodilation. A newer study (Kosalec et al, 2005) used the essential oil and extract from anise to study the antifungal activity. There were significant differences in antifungal activity between the essential oil and fluid extract. The essential oils' antifungal activity was much stronger than the extract. Anise suspension has identified a protective quality against gastric-induced ulcers in rats (Al Mofleh et al, 2007). The volatile oil in anise, anethole, may be responsible for the estrogenic action (Newell et al, 1996).

Product Availability

Essential oil, toothpaste, whole herb

Plant Part Used: Fruit (ripe and dried)

Dosages

- Adult PO essential oil: 1-5 drops diluted prn (Moore, 1996)
- Adult PO whole herb: 3 g (Blumenthal, 1998)
- Adult topical: 5%-10% concentration essential oil, applied prn; spirit of anise 0.25-0.50 tsp (1:10 dilution in alcohol), diluted (Moore, 1996)
- Child PO tea: ½-3 cups daily (Romm, 2003)

Contraindications

Anise is not recommended for therapeutic use during pregnancy. It should not be used by persons with hypersensitivity to anise or anethole. The essential oil should never be given to children. Anise may be used during breastfeeding.

Side Effects/Adverse Reactions

CNS: *Seizures* (essential oil) (internal)
EENT: Stomatitis (toothpaste)
ENDO: Hypermineralocorticism (internal)
GI: Nausea, vomiting, anorexia (internal)
INTEG: Hypersensitivity, contact dermatitis
RESP: *Pulmonary edema* (essential oil) (internal)

Interactions

Drug

Estrogens, hormonal contraceptives: Large quantities of anise may interfere with estrogen replacement therapy or hormonal contraceptives (theoretical) (Jellin et al, 2008).
Iron: Anise may increase the action of iron; do not use concurrently.
Warfarin: Anise may increase the action of warfarin, do not use concurrently (Heck et al, 2000).

Lab Test

Increased: PT, INR

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil	Anethole	Antimicrobial, antifungal, estrogenic
Alpha-pinene		
Coumarin	Bergapten	Photosensitivity, carcinogenic
	Umbelliprenine; Umbelliferone; Scopoletin	
Lipid/fatty acid		
Flavonoid	Quercetin	Antiinflammatory
	Rutin; Luteolin; Isoorientin; Isovitexin; Apigenin	
Sitosterol		
Linalool		
Anisaldehyde		

Client Considerations

Assess

- Assess the reason the client is using this product.
- Assess the client for hypersensitivity reactions and contact dermatitis. If these are present, discontinue use of anise and institute antihistamines or another appropriate therapy.

- Assess for the use of iron supplements, warfarin (see Interactions).
- Assess the client's fluid and electrolyte balance. Weigh the client weekly to determine water and sodium retention.

Administer

- Instruct the client to take anise PO using the whole herb or seeds. The essential oil should be used under an herbalist's supervision only. Toxicity can occur.

Teach Client/Family

- Caution the client not to use anise therapeutically during pregnancy. It may be used during breastfeeding.
- Caution the client that anise tea is often used to treat children's respiratory conditions, but the essential oil should never be given to children.
- Caution the client not to use anise essential oil without an herbalist's supervision; toxicity is common. Both seizures and pulmonary edema can result.
- Caution the client that *Illicium anisatum* L. is poisonous and that it can easily be confused with *Illicium verum* (Small, 1996).

Arginine

(ahr'juh-neen)

Scientific name: 2-amino-5-guanidinopentanoic acid

Other common names: Arginine hydrochloride, L-arginine

Origin: Synthetic

Uses

Arginine is a supplement used for congestive heart failure, erectile dysfunction, peripheral vascular disease, angina, interstitial cystitis, and chronic renal failure. Other uses may include upper respiratory infections, diabetes, burns, adrenoleukodystrophy, migraine, wound healing, and an appetite supplement in AIDS.

Actions

Cardiovascular Action

Several studies have identified the cardiovascular actions of arginine. Hambrecht et al (2000) showed a corrective action on endothelial dysfunction in chronic congestive heart failure. In another study (Rector et al, 1996) patients showed a considerable improvement in congestive heart failure when arginine was given for 4 to 6 weeks. The effect on angina patients was similar. Three studies (Bednarz et al, 2000; Blum et al, 1999; Maxwell et al, 2000) showed consistent improvement in the ECG and symptoms of angina when arginine was added at the dose of 6 g/day.

Erectile Dysfunction

The use in erectile dysfunction showed contradictory results. One study (Chen et al, 1999a) showed considerable improvement in erectile dysfunction after the addition of 5 g/day for 6 weeks. Another study (Moody et al, 1997) showed no improvement when 1.5 g/day was administered for 17 days.

Other Actions

Other actions that have been studied include peripheral vascular disease, interstitial cystitis, chronic renal failure, diabetes, and upper respiratory infections. Most of these conditions have only one study each, with very limited results.

Product Availability

Tablets, capsules, IV

Dosages

- Adult PO: 2-3 g/day; may increase to 15 g/day in cardiac disease

Very little information is available on dosages.

Contraindications

Until more research is available, avoid use in children, pregnancy, or breastfeeding. Avoid use in severe hepatic disease, herpes, acrocyanosis, asthma, hypotension, renal disease.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, cramping, increased number of stools
META (IV use): Increased BUN, hyperkalemia

Interactions

Drug

ACE inhibitors, potassium-sparing diuretics: ACE inhibitors and potassium-sparing diuretics taken with arginine (IV) may lead to fatal hypokalemia (theoretical).
Alcohol, NSAIDs, platelet inhibitors, salicylates: Alcohol, NSAIDs, platelet inhibitors, and salicylates taken with arginine may cause gastric irritation.
Antihypertensives: Arginine taken with antihypertensives may lead to increased hypotension (theoretical) (Jellin et al, 2008)
Cyclosporine: Arginine may counteract the therapeutic effects of cyclosporine (Jellin et al, 2008)

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Essential amino acid	L-Arginine	Antianginal

Client Considerations

Assess

- Assess the reason the client is using this product.
- Assess for severe hepatic disease, renal disease, hypotension, acrocyanosis, and asthma. Avoid giving arginine in these conditions.
- Identify medications taken such as ACE inhibitors, alcohol, NSAIDs, potassium-sparing diuretics, platelet inhibitors, salicylates. Avoid use of arginine with these medications.

Administer

- Arginine IV should be given only by a qualified herbalist or other integrative medicine specialist. Severe hypokalemia and increased BUN may occur.

Teach Client/Family

- Advise the client not to use arginine in children or those who are pregnant or breastfeeding until more research is available.

Arnica

(ahr'ni-kuh)

Scientific name: *Arnica montana* L.; may also include *A. chamissonis less., A. cordifolia hook, A. fulgens pursh, A. soronia greene*

Other common names: Leopard's bane, common arnica, sneezewort, mountain snuff, mountain tobacco, wolf's bane

Origin: Arnica grows wild in the mountains of Europe and Russia. Some species can be found in the western United States.

Uses

Arnica is used topically to decrease inflammation in bruises, sprains, wounds, acne, boils, rashes. It may be used in cardiovascular problems to decrease cholesterol if supervised by a qualified herbalist. Arnica should not be used internally except under the supervision of a qualified herbalist. It is used in small quantities as a flavor in beverages and desserts (Jellin et al, 2008).

Actions

Antiinflammatory Action

Two studies have identified antiinflammatory properties of arnica. One study (Lussignoli et al, 1999) found that inflammation was decreased in rat paw edema, possibly due to a decrease in interleukin-6. Another study (Schaffener, 1997) showed the antiinflammatory effect of helenalin, one of the chemical components of arnica. A more recent study (Brinkhaus et al, 2006) showed that clients who took homeopathic arnica had much less postoperative swelling after arthroscopy.

Cytotoxic Action

One study (Willuhn et al, 1994) showed low cytotoxicity when compared with other antineoplastics. Helenalin showed the greatest cytotoxic effect.

Other Actions

Arnica montana decreased mild postpartum bleeding in a randomized double-blind, placebo-controlled study of 40 participants (Oberbaum et al, 2005).

Product Availability

Topical: spray, cream, salve, ointment; oral: tablets, tea, tincture, sublingual

Plant Parts Used: Dried flower heads, rhizome

Dosages

- Adult topical: apply to affected area as needed

Very little information is available on dosages.

Contraindications

Pregnancy category 7; breastfeeding category 5A.

Because arnica is considered poisonous, injection is contraindicated. Death can occur. Internal use is contraindicated unless supervised by an expert; serious renal and hepatic damage can occur. Arnica should not be used in children. Do not use full-strength tincture on broken skin as contact dermatitis can occur. Do not use for prolonged periods.

Continued

Side Effects/Adverse Reactions

INTEG: Rash, contact dermatitis

If taken internally (contraindicated)

CNS: Nervousness, restlessness, *coma, death*
CV: *Cardiac arrest, cadiotoxicity,* hypertension
GI: Abdominal pain, diarrhea, vomiting, anorexia, *hepatic failure*
HEMA: *Bleeding*
INTEG: Contact dermatitis (topical), *Sweet syndrome*
MS: Weakness
RESP: Dyspnea

Interactions

Drug

Antihypertensives: May decrease the antihypertenisve effect if arcina is taken internally.

Lab Test

APTT, PT, INR: Arnica increases these lab tests.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Polysaccharide	Galacturonic acid	Inhibits complement; increases immune response
	Phenolic compound	
Sesquiterpenes	Helenalin; 11-Alpha; 13-Dihydrohelenalin	Cardiotoxic; inhibits platelet aggregation; cytotoxicity; analgesic; antiinflammatory

Client Considerations

Assess

- Assess the reason the client is using this product.
- Assess the condition of the skin: broken, bruised, rashes. Arnica should not be used for prolonged periods on this type of skin.
- Assess for Sweet syndrome, psoriasis.

Administer

- Use only topically, unless under the supervision of a qualified herbalist.
- Do not use for prolonged periods; allergic reactions may occur.
- Do not use full-strength on broken, hypersensitive skin. Do not use on open wounds or abrasions.

Teach Client/Family

- Teach the client not to use internally unless supervised by a competent herbalist. Arnica is considered poisonous and can be cardiotoxic. Serious hepatic and renal toxicity can occur.
- Inform the client that pregnancy category is 7 and breastfeeding category is 5A.

= Pregnancy = Pediatric = Alert = Popular Herb

- Instruct the client not to use for extended periods on broken or bruised skin; contact dermatitis can occur.
- Keep out of reach of children; ingestion of flowers or roots can lead to death.

Artichoke

(ahr'tuh-chowk)

Scientific name: *Cynara scolymus asteraceae*

Other common names: Alcachofra, garden artichoke, globe artichoke

Origin: Artichoke is cultivated in central Europe and the Mediterranean.

Uses

Artichoke is used to lower cholesterol levels, to increase appetite, to aid digestion, and for indigestion in the upper gastrointestinal tract. It also has antioxidant and hepatoprotective properties.

Actions

There are very few studies for any use or action. However, artichoke is being marketed for its possible antilipidemic, hepatoprotective, and digestant properties.

Antilipidemic Action

The studies relating to the antilipidemic action of artichoke are minimal. In one study (Petrowicz et al, 1997) artichoke leaf was administered to 44 individuals with no change in cholesterol levels. However, a later study (English et al, 2000) saw a drop in cholesterol and LDL/HDL ratios that was statistically significant. The drop in cholesterol levels may be due to cynarin and luteolin, two chemical components in artichoke. These components may interfere with cholesterol synthesis.

Other Actions

Two other actions are included in beginning research. These include the hepatoprotective effects of artichoke and the reduction in gastrointestinal symptoms, including dyspepsia. Artichoke leaf may protect the liver from harmful effects (Kraft, 1997).

Product Availability

Standardized extract (2.5%-15% caffeylquinic acid), tincture (5:1 dilution)

Plant Part Used: Leaf

Dosages

- Adult PO standardized extract: 1-2 (320 mg) caps tid (McCaleb et al, 2000)
- Adult PO tincture (5:1 dilution): 15-30 drops in a small amount of water tid (McCaleb et al, 2000)
- Adult PO dried herb: 6 g in three divided doses (Blumenthal, 1998)

Irritable Bowel Syndrome

- Adult PO leaf extract: 640 mg daily (Jellin et al, 2008)

Dyspepsia

- Adult PO leaf extract: 320-640 mg daily (Jellin et al, 2008)

High Cholesterol

- Adult PO fluid extract: 1800-1920 mg/day in 2 or 3 divided doses (Jellin et al, 2008)

Contraindications

Artichoke should not be used by those with bile duct blockage, gallstones, or hypersensitivity to artichoke or Asteraceae family herbs such as arnica or chrysanthemums. Until further research is completed, medicinal artichoke should be avoided in children or those who are pregnant or breastfeeding until more research is available. Use cautiously in hepatic or renal disease.

Side Effects/Adverse Reactions

GI: Hunger
MS: Weakness

Interactions

Drug

Iron salts: Artichoke tea may interfere with the absorption of iron salts.

Lab Test

Blood glucose: Artichoke decreases blood glucose.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Acid	Caffeic acid; Caffeylquinic acids; Chlorogenic acid	
	Cynarin	Antilipidemic, hepatoprotectant
	Cynaroside	
	Luteolin	Antilipidemic
	Scolymoside	

Client Considerations

Assess

- Assess the reason the client is using this product.
- Assess the client for the presence of gallstones, bile duct blockage, or past hypersensitivity to artichoke or plants in the Asteraceae family.
- Identify if the client is using iron salts, since artichoke in a tea may interfere with iron salts absorption.

Hyperlipidemia

- Obtain cholesterol testing on a regular basis if client is using for hyperlipidemia.
- Obtain a diet history to identify high-cholesterol foods that may need to be eliminated.

Administer

- Using tincture or fluid extract mixed in a small amount of water.

Teach Client/Family

- Advise the client to avoid use in children or those who are pregnant or breastfeeding until more research is available.

Ash

Scientific names: *Fraxinus americana, Fraxinus atrovirens, Fraxinus excelsior, Fraxinus beterophylla, Fraxinus jaspida, Fraxinus polemoniipolia, Fraxinus simplifolia, Fraxinus verticillata*

Other common names: Bird's tongue, common ash, European ash, weeping ash, white ash (not the same as prickly ash)

Origin: Ash is a tree found in regions of North America.

Uses

Ash has been used traditionally as a diuretic and tonic.

Investigational Uses

Ash is being investigated as an antiinflammatory for rheumatic and arthritic conditions. Some reports identify ash to be as good an antiinflammatory as nonsteroidal antiinflammatories.

Actions

Very little research has been done on ash. A few studies have focused on the antiinflammatory properties of ash. One study (el-Ghazaly et al, 1992) compared ash with diclofenac. The results from both were similar.

Product Availability

Liquid extract (no standardized extract is available)

Plant Parts Used: Leaves, bark

Dosages

- Adult PO: 20-40 drops tid-qid, use in water or other fluids

Contraindications

Class 1 (bark).

Ash should not be used in children or those who are pregnant or breastfeeding until more research is available. Ash is contraindicated in clients with hypersensitivity to this product or salicylates.

Side Effects/Adverse Reactions

GI: Slight nausea

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Flavonoids	Rutin	
Iridoide monoterpenes		
Mannitol		
Tannins		
Triterpenes		
Phenolic acids		
Phytosterols		
Mucilages		
Hydroxycoumarins	Fraxin; Isofraxidin; Aesculin	

Client Considerations

Assess

- Identify the reason the client is using this product.
- Assess mobility and decrease in inflammation if using for arthritic conditions. Monitor ROM, swelling, and heat of joints.

Administer

- Give fluid extract in a small amount of water or other fluids.

Teach Client/Family

- Advise the client to keep ash away from children and pets. The FDA considers this herb unsafe and poisonous.
- Advise the client not to confuse ash with northern prickly ash or southern prickly ash (Jellin et al, 2008).

Astragalus

(as'tri-guh-lus)

Scientific names: *Astragalus gummifer, Astragalus membranaceus*

Other common names: Huang-qi, tragacanth, Milk Vetch, Yellow Leader

Origin: Astragalus is available throughout the world. The most common species are grown in China, Japan, and Korea.

Uses

Astragalus is used to treat bronchitis, chronic obstructive pulmonary disease, colds, flu, gastrointestinal conditions, weakness, fatigue, chronic hepatitis, ulcers, hypertension, and (by injection) viral myocarditis (Chang et al, 1987). This herb is used in contemporary Chinese medicine and other models to improve immune system health. Astragalus is thought to be an aphrodisiac and may improve sperm motility.

Investigational Uses

Researchers are experimenting with the use of astragalus to treat cancer and to increase immunity in HIV/AIDS. It is also commonly used to decrease the toxic effects of radiation or chemotherapy. Astragalus may lower blood glucose levels and may be used in combination with other herbs.

Actions

Stimulation of Immunity and Anticancer Action

Studies have shown that astragalus improves immune function in a number of ways. It increases the numbers of both macrophages (Kajimura et al, 1996) and white blood cells. Another study has shown an increase in immunoglobulins A, G, and M and a concurrent decrease in upper respiratory infections. Astragalus also increases the functioning of B-cells (Kajimura et al, 1997) and T-cells (Mavligit et al, 1979). Astragalus may intensify phagocytosis, stimulate pituitary-adrenal activity, and stimulate production of interferon. These research studies provide evidence for the use of astragalus to treat cancer and other conditions with decreased immune response such as HIV/AIDS.

Cardioprotective Action

Astragalus has been widely used for viral diseases, including viral myocarditis in China. This study (Chen et al, 2006a) looked at the cardioprotective effects on mice induced with this type of infection. Astragalus showed similar improvement compared with the use of perindopril for treating viral myocarditis.

Product Availability

Capsules, decoction, fluid extract, solid (dry) extract, tincture

Plant Part Used: Roots

Dosages

Dosage can vary widely

- Adult PO capsules: 400-500 mg 8-9 times/day (Foster, 1999), up to 8-15 g/day
- Adult PO decoction: 9-30 g dried root/day (Mills, Bone, 2000), boil for 1-2 hr, drain
- Adult PO fluid extract: 4.5-8.5 ml/day in divided doses (1:2 dilution) (Mills, Bone, 2000) or 2-4 ml tid (1:1 dilution) (Murray, Pizzorno, 1998)
- Adult PO solid (dry) extract: 100-150 mg tid (0.5% 4-hydroxy-3-methoxy isoflavone) (Murray, Pizzorno, 1998)

Contraindications

Pregnancy category 2; breastfeeding category 1A.

Astragalus should not be used by persons with acute infections, or in the presence of fever or inflammation. Astragalus may be given to children.

Side Effects/Adverse Reactions

INTEG: Allergic reactions (rare)

Interactions

Drug

Antihypertensives: Astragalus may decrease or increase the action of antihypertensives; avoid concurrent use.

Cyclophosphamide: Astragalus may decrease the effect of cyclophosphamide.

Immunosuppressants: Astragalus may interfere with immunosuppressant therapy (theoretical) (Jellin et al, 2008).

Interferon: The combination of interferon and astragalus has been shown to prevent or shorten the duration of upper respiratory infections.

Interleukin-2: Astragalus may increase the effect of drugs such as interleukin-2 (IL-2). In contrast, other studies have shown that the effects of IL-2 can be decreased when combined with astragalus. Research is inconclusive at this time.

Lab Test

Semen specimen analysis: Astragalus may increase sperm motility in vitro.

PT, INR: Astragalus may increase PT, INR.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Glycosides	Astragalan I, II, III; Bassorin; Tragacanthin	Increased immunity
Saponin	Astramembrannin I, II	Increased immunity
Betaine		
Beta-sitosterol choline		
Polysaccharides	Astroglucans A, B, C	
Vitamin A		
Flavonoids		

Client Considerations

Assess

- Assess for allergic reactions; if present, discontinue use of this herb and administer antihistamine or other appropriate therapy.
- Assess for the use of other medications, including IL-2, the action of which may be increased (see Interactions).
- Assess for infections, fever, inflammation. Astragalus should not be used in infection, fever, or inflammation.

Administer

- Instruct the client to take astragalus PO as a tincture, decoction, fluid extract, or in capsule form.
- Inform the client that astragalus injections, which are used to treat viral myocarditis, are to be given by naturopaths only.

Teach Client/Family

- Inform the client that pregnancy category is 2 and breastfeeding category is 1A.
- Inform the client that astragalus may be given to children.
- Caution the client not to use astragalus if experiencing acute infections or inflammation.
- Inform the client that this herb is generally considered safe.

Avens

(a′vunz)

Scientific name: *Geum urbanum*

Other common names: Benedict's herb, bennet's root, blessed herb, city avens, clove root, colewort, geum, goldy star, herb bennet, way bennet, wild rye, wood avens

Origin: Avens is a member of the rose family found in Europe.

Uses

Avens has traditionally been used internally to treat diarrhea, sore throat, fever, headache, and gastric inflammation. It has also been used as an astringent, antiinflammatory, and antiseptic. Topically, avens has been used to treat wounds and hemorrhoids. It is rarely used today. It may be used as a flavoring in food.

A

Actions

Research studies of the effects of avens on humans are nonexistent, and animal studies are rare. Most reported uses for this herb are anecdotal. Few avens products are available in the United States.

Antiinflammatory Action

The antiinflammatory action of avens may result from its ability to produce prostaglandins and decrease cyclooxygenase (Tunon et al, 1995). Avens is thought to possess antiinflammatory action equal to that of NSAIDs; however, no research is available to either confirm or disprove this action.

Product Availability

Fluid extract, powder, tea, tincture

Plant Parts Used: Dried plant, rhizome, roots

Dosages

Many different dosages are reported.

Wound Healing

- Adult topical: apply prn

Other

- Adult PO fluid extract of herb: 1 dram
- Adult PO fluid extract of root: ½-1 dram
- Adult PO powdered root/herb: 15-30 grains as a tonic
- Adult PO tea: 1-4 g steeped in boiling water, strained, 3 ×/day (Jellin et al, 2008)

Contraindications

Until more research is available, avens should not be used during pregnancy and breastfeeding. It should not be given to children.

Side Effects/Adverse Reactions

GI: Nausea, anorexia, dyspepsia

Interactions

Lab Test

BUN creatinine: Avens may increase BUN, creatinine.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil	Eugenol	Antiinflammatory; antioxidant, astringent
Tannin		Wound healing; antiinflammatory
Gum		
Resin		
Roots Also Contain		
Acid	Gallic acid; Caffeic acid; Chlorogenic acid	

Client Considerations

Assess

Antiinflammatory

- Assess the client for pain: location, intensity, duration. Determine what alleviates and aggravates the condition.
- Assess for the use of prescription and over-the-counter medications to treat pain and inflammation.

Administer

- Instruct the client to take avens PO as an extract, or as a powder made from the herb or its roots.

Teach Client/Family

- Caution the client not to use avens in children or those who are pregnant or breast-feeding until more research is available.
- Instruct the client to report any changes in the symptoms or characteristics of the condition.
- Advise the client to use this herb with caution or under the supervision of a qualified herbalist because research on the use, side effects, and toxicity of avens is rare.

Balsam of Peru

(bawl'sum uv Peh'rew)

Scientific names: *Myroxylon balsamum, Myroxylon pereirae*

Other common names: Balsam of tolu, balsam tree, opobalsam, Peruvian balsam, resina tolutana, resin tolu, Thomas balsam

Origin: Balsam of Peru is a tree found in Central and South America.

Uses

Balsam of Peru in suppository form is used to treat hemorrhoids. This herb is used internally to treat postextraction alveolitis, cough, bronchitis, colds, burns, fever, lowered immunity, and parasites (scabies). Balsam of Peru is also taken orally as a diuretic and to expel worms. Topically, it is used to heal wounds, promote local circulation, ease joint and arthritic complaints, and treat dry socket in dentistry (Jellin et al, 2008).

Actions

Balsam of Peru is used primarily for generalized wound healing. Skin graft donor sites were treated with balsam of Peru–trypsin ointment to assist in healing skin graft donor sites. This retrospective study used 36 clients, all showing considerable improvement in the donor sites (Carson et al, 2003). Because it is an oleoresin and tends to be a warming herb, balsam of Peru is used to improve circulation and relieve congestion.

Product Availability

Cream, feminine hygiene products, lotion, ointment, other commercial products, shampoo, suppositories

Plant Part Used: Bark (oleo resin)

Dosages

Hemorrhoids

- Adult suppositories: 1.8-3 mg prn

Wound Healing

- Adult topical: 5%-20% concentration ointment, used for no longer than 7 days

Contraindications

Class 2d herb.

Use topically for no longer than 7 days. Persons with kidney irritation or febrile illnesses should avoid the use of balsam of Peru.

Side Effects/Adverse Reactions

GU: *Albuminuria, pyelitis, necrosis of the kidney* (if taken internally)
INTEG: Contact dermatitis, photodermatitis

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Ester mixture	Cinnamein	Antiseptic; antibacterial
	Cinnamic acid ester	Antiseptic; antibacterial
Resin		Wound healing, epithelial cell growth
Benzoic acid		
Volatile oil		

Client Considerations

Assess

- Assess the reason the client is using this product.
- Assess the client for contact dermatitis and photodermatitis after prolonged use. Discontinue the use of this herb if these conditions are present.

Administer

- Instruct the client to use as a topical or suppository. This herb may be used PO if under the direction of a qualified herbalist.

Barberry

(bahr'beh-ree)

Scientific name: *Berberis aquifolium* Pursh

Other common names: Berberry, jaundice berry, oregon grape, pepperridge bush, pipperidge, sour-spine, sowberry, trailing mahonia, wood sour

Origin: Barberry is a shrub found in Europe and North America.

Uses

Barberry has been used for many centuries for kidney pain and the removal of kidney stones (Arayne et al, 2007). It is used as an antimicrobial against a wide variety of bacteria, fungi, viruses, helminths, and chlamydia. Primary uses for barberry include bacterial diarrhea, intestinal parasite infection, and ocular trachoma infections. It antagonizes the effects of cholera and *Escherichia coli,* decreases ventricular tachyarrhythmias, decreases inflammation, and increases platelets in thrombocytopenia. Barberry can lower heart rate and enhance the flow of bile through hepatic function. It may be used for stomach ailments, ulcers, and as a cathartic. Barberry may also be used topically to treat dry, scaly skin, and psoriasis.

Actions

Barberry has been used for more than 3000 years in Chinese and Ayurvedic medicine.

Antimicrobial Action

Many studies have demonstrated the effectiveness of barberry against a wide variety of fungi, protozoans, helminths, viruses, and bacteria, including *Chlamydia* spp. Sensitivity screens were performed on 54 different microorganisms using berberine, one of the alkaloids of barberry. Antimicrobial effects were found against gram-positive and gram-negative organisms, as well as protozoa. Barberry was found to be effective against *Bacillus cereus, Bacillus pumilus, Bacillus subtilis, Candida albicans, Candida glabrata, Candida tropicalis, Candida utilis, Corynebacterium diphtheriae, E. coli, Entamoeba histolytica, Giardia lamblia, Klebsiella pneumoniae, Leishmaniasis* spp., *Mycobacterium tuberculosis, Shigella boydii, Sporotrichum schenkii, Staphylococcus albus, Staphylococcus aureus, Streptococcus pyogenes, Trichophyton mentagrophytes, Trichomonas vaginalis,* and *Vibrio cholerae*. Barberry may also be effective against HIV-1 by inhibiting HIV-1 reverse transcriptase (Gudima et al, 1994).

Cardiovascular Action

In one study using cats, barberry demonstrated both positive and negative inotropic and antihypertensive effects. In a human study of 12 patients with refractory congestive heart failure, participants were studied before and after intravenous administration of berberine. Low doses produced no circulatory changes, whereas higher doses caused a significant reduction in pulmonary vascular resistance and a decrease in left ventricular end-diastolic pressure. Measurable increases occurred in stroke index, ventricular injection fraction, and left ventricular ejection fraction (Marin-Neto et al, 1988). Another study of 100 individuals with ventricular tachyarrhythmias reported that berberine suppressed premature ventricular contractions without serious side effects (Huang et al, 1990). Several methods of action have been proposed for the cardiovascular actions of berberine, including calcium channel blocking (Zhou et al, 1995), potassium channel blocking (Hua et al, 1994), and inhibition of catecholamine synthesis (Lee et al, 1996).

Product Availability

Fluid extract tablets, tea, tincture

Plant Parts Used: Fruit (rarely used), root bark

Dosages

- Adult PO decoction: 1.5-3 g/day (Mills, Bone, 2000)
- Adult PO fruits: 1-2 tsp whole or mashed barberries in 150 ml boiling water, steeped 10-15 min and strained (berberidis fructus)
- Adult PO fluid extract: 6-9 ml/day (1:1 dilution) (Mills, Bone, 2000)
- Adult PO tablets: 200 mg bid-qid
- Adult PO tincture: 3-6 ml/day (1:2 dilution) (Mills, Bone, 2000)

Contraindications

Pregnancy category is 5; breastfeeding category is 4A.
Do not use in neonatal jaundice (Mills, Bone 2005).

Side Effects/Adverse Reactions

CNS: Confusion, disorientation
CV: Hypotension, *cardiac damage*
GI: Diarrhea, gastrointestinal discomfort, *hepatotoxicity*
GU: *Nephritis, spontaneous abortion*
RESP: Dyspnea

Interactions

Drug

Antihypertensives: Barberry may increase the antihypertensive action; use cautiously.
Calcium channel blockers: Barberry may increase the effect of calcium channel blockers.

Lab Test

AST/ALT, total bilirubin, urine bilirubin: Barberry may increase these test values.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid, isoquinoline	Berberine	Decreased blood pressure, antiarrhythmic, antiplatelet, immunosuppressant
	Oxyacanthine	K^+ channel blocking
	Isochinoline	Uterine stimulant
	Berbamine	
	Bervulcine	
	Jatorrhizine	
	Magnoflorine	
	Aporphine	
	Palmatine	
Anthocyan		
Chlorogenic acid		
Phenol	Syringaresinol	Antiinflammatory

Client Considerations

Assess

- Assess the reason the client is using this product.
- Assess the client for hypersensitivity reactions and toxicity. Discontinue use of this herb if these are present.
- Assess for possible or confirmed pregnancy.
- Assess cardiac status (blood pressure; ECG; pulse; heart rate, rhythm, and character) in clients who are using barberry to treat ventricular tachyarrhythmias.
- Assess for confusion and disorientation, diarrhea, nephritis. Discontinue use of this herb if these conditions are present.

Administer

- Instruct the client to take barberry PO as the whole herb, infusion (tea), commercial tablets, or tincture. It is bitter and should be taken in small doses. Large doses may cause nausea, vomiting, and a drop in blood pressure.
- When using barberry as a compress for conjunctivitis, soak the cloth in barberry infusion.
- Use less than 500 mg per day; berberine considered toxic (Jellin et al, 2008).

Teach Client/Family

- Inform the client that pregnancy category is 5 and breastfeeding category is 4A.
- Inform the client that there are more effective medications than barberry for controlling ventricular tachyarrhythmias.

Barley

(bahr'lee)

Scientific names: *Hordeum distichon, Hordeum irregulare, Hordeum jubalum, Hordeum leporinum, Hordeum vulgare*

Other common names: Barley grass, foxtail grass, hare barley, milled barley, pearl barley, scotch barley, wild barley

Origin: Barley grows wild in Asia and parts of Ethiopia. It is cultivated in many parts of the world.

Uses

Barley has been used traditionally for irritable bowel syndrome, diarrhea, and gastritis. It has also been used to decrease cholesterol, prevent cancer, and control diabetes.

Actions

Most studies using barley focus on the intestinal actions. One study (Gruenwald et al, 1998) identified barley as a demulcent and reported healing of the gastrointestinal tract. Another study (Mitsyama et al, 1998) identified the barley in food as having a healing effect and improving damage in the gastrointestinal tract in animals. The juice contains many vitamins, including B_1, B_2, B_6, B_{12}, panothenic acid, folic acid, and beta carotene, and many minerals, including potassium, calcium, magnesium, and phosphorous.

Product Availability

Contained in food; no specific forms are available.

Plant Part Used: Grain

Dosages

No published dosages are available.

Contraindications

Barley should not be used medicinally (high doses) in pregnancy or in those with barley sensitivity (Jellin et al, 2008).

Side Effects/Adverse Reactions

SYST: *Anaphylaxis*, asthma

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Fatty oils	Linoleic acid; Oleic acid	Demulcent
Hydroxycoumarins	Aesculetin; Gramine; Herniarin; Hordenine	
	Scopotetin; Tyramine Umbelliferone	Sympathomimetic
Oligosaccharides	Glucodifructose; Glucose; Fructose; Raffinose; Saccharose	

Continued

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Polysaccharides	Starch; Fructans	
Vitamins	B_2; B_6; E; Folic acid; Nicotinic acid; Panothenic acid	
Proteins	Albumin; Globulin; Glutelines; Prolamines	
Fiber		

Client Considerations

Assess

- Determine the reason the client is using barley medicinally.
- Assess for barley sensitivity, and exposure to barley flour, because it can cause asthma.

Administer

- Administer after receiving diagnosis of gastrointestinal symptoms.
- Instruct the client to store barley in a cool, dry place, away from moisture.

Teach Client/Family

- Caution the client that barley should not be used medicinally in pregnancy until more research is available.

Basil

(ba'zul)

Scientific names: *Ocimum basilicum, Ocimum sanctum*

Other common names: Common basil, sweet basil, holy basil, St. Josephwort

Origin: Basil is a member of the mint family found throughout the world.

Uses

Basil is used as an antiseptic, antidiabetic, antiinflammatory, and immunostimulant. It is also used to treat ulcers, arthritis, renal disease, insect bites (Jellin et al, 2008), and joint edema. Contemporary uses include treatment for flatulence, anxiety, and coughs.

Investigational Uses

Researchers are studying the immunostimulant properties and the performance enhancement properties (Maity et al, 2000) of *Ocimum sanctum.*

Actions

Research has focused on the hypoglycemic, antiinflammatory, and immunostimulant properties of basil.

Hypoglycemic Action

One study of 62 patients with type 2 diabetes demonstrated the ability of basil to lower blood glucose levels (Reichart, 1997). All of the participants underwent a 10-hour fasting blood glucose test after discontinuing any other hypoglycemics 1 week before the test. In addition, all patients completed a 5-day washout period to clear all other agents from their systems before the study began. Results showed that fasting blood glucose levels decreased 17% with the use of basil as compared with the use of a placebo. Both cholesterol and urinary glucose levels also decreased, but not significantly.

Antiinflammatory Action

A 1996 study by Singh used fixed *O. sanctum* to treat rats with inflamed paws. Basil exerted significant activity as an antiarthritic and antiinflammatory. The study also demonstrated the antiinflammatory and analgesic effects of basil when given intraperitoneally (Singh et al, 1996).

Immunostimulant Action

To identify its immunoregulatory profile in sheep erythrocytes, basil was tested against *Salmonella typhosa.* The results showed an increased antibody titer and may indicate that basil could be used as an immunostimulant (Godhwani et al, 1988). In Ayurvedic medicine, basil has been used to increase immunity and metabolic function and to treat respiratory problems.

Other Actions

O. sanctum root extract was found to increase swimming performance in mice. This study suggests that this effect may be due to a central nervous system stimulant and/or antistress activity (Maity et al, 2000). Basil may possess antioxidant properties as demonstrated by its radical scavenging activity (Yun et al, 2003; Berić, et al 2008).

Product Availability

Leaves (chopped and powdered), tea, tincture

Plant Part Used: Leaves (fresh and dried)

Dosages

- Adult PO dried leaves (tea): 2.5 g in ½ cup water, strained, daily or bid
- Adult PO tincture: 1-2 ml 3-5 times/day (1:5 dilution) (Smith, 2007)

Contraindications

Class 2b/2c/2d herb.

Basil is not recommended for therapeutic use during pregnancy and breastfeeding and should not be given therapeutically to infants or toddlers. Basil should be used cautiously by persons with diabetes and those who use this herb for extended periods.

Side Effects/Adverse Reactions

ENDO: Hypoglycemia

GI: *Hepatic carcinoma*

Interactions

Drug

Antidiabetics, insulin: Basil (medicinally) may increase the hypoglycemic effects of insulin, antidiabetics; do not use concurrently.

Lab Test

Blood glucose: Basil may increase blood glucose levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Sesquiterpenes		
Volatile oil	Linalool	Analgesic
	Estragole	Increased immunity; mutagenic
	Eugenol; Methyleugenol	Antioxidant
	Triterpene, Methyl chavicol (Zhelijazkov et al, 2008)	
Flavonoid		Antiulcer
Phenylpropanes		
Caffeic acid		
Monoterpenes	Cineol; Geraniol; Camphor; Ocimene	

Client Considerations

Assess

- Assess diabetic clients for the use of antidiabetics or insulin (see Interactions).
- Assess diabetic clients for symptoms of hypoglycemia and hyperglycemia.

Administer

- Instruct the client to take basil PO either fresh or as a powder. Only the leaves should be used.

Teach Client/Family

- Caution the client not to use basil therapeutically during pregnancy and breastfeeding and not to give it therapeutically to infants or toddlers. One of the chemical components of basil, estragole, can produce mutagenic effects when taken in high levels during pregnancy.
- Caution the client not to use basil for extended periods of time; it is a known mutagen.
- Caution the client not to use basil concurrently with oral antidiabetic agents or insulin; hypoglycemia may occur.

Bay

(bay)

Scientific name: *Laurus nobilis*

Other common names: Bay laurel, bay leaf, bay tree, laurel, sweet bay, Roman laurel

Origin: Bay is found in Mediterranean areas.

Uses

Bay is used as a rubefacient and as a treatment for rheumatic disorders, gastric ulcers, amenorrhea, colic, polyps, cancer, and spasms. Bay fruits are used in the treatment of uterine fibroids, cirrhosis, and joint pain (Duke, 2003). Bay has been

used as a repellent for cockroaches (Verma et al, 1981), and as a cooling herb. Therapeutic use of bay is uncommon.

B

Actions

Antiulcerogenic Action

When researchers administered bay to rats with induced gastric ulcers, results indicated antiulcerogenic activity for bay extracts at 20% and 40% and an oily fraction of the seeds. Acute toxicity studies also found bay to be safe when used in this manner.

Antidiabetes Action

Bay has been shown to both stimulate and decrease the actions of glucose. Hypoglycemic activity has been reported for bay leaf extracts (Ashaeva et al, 1984).

Other Actions

The volatile oil of bay leaves has been shown to possess bactericidal and fungicidal activity (MacGregor et al, 1975). Wound healing activity was demonstrated in a study (Nayak et al, 2006). The study using rats showed that bay can be used to treat different types of wounds. The effects were assessed by rate of wound closure, period of epithelialization, content and histopathology of tissue granulation.

Product Availability

Creams (essential oil), extract, fruit, leaves (typically used as a spice), lotions (essential oil), soaps (essential oil)

Plant Parts Used: Berries, leaves, oil

Dosages

- Adult PO: Dosage varies widely
- Adult topical: apply creams, lotions, and soaps as desired

Contraindications

Class 1 herb.

Until more research is available, bay should not be used therapeutically during pregnancy and breastfeeding. It should not be given therapeutically to children.

Side Effects/Adverse Reactions

GI: *Impaction, perforation of gastrointestinal tract, severe gastrointestinal bleeding (whole intact leaf)*

INTEG: Contact dermatitis

RESP: *Asthma*, dyspnea

Interactions

Drug

CNS depressants, opioids: Bay may increase the action of CNS depressants, opioids; avoid concurrent use (Jellin et al, 2008).

Antidiabetics, insulin: Bay may increase the hypoglycemic effects of insulin, antidiabetics; do not use concurrently.

Lab Test

Blood glucose: Bay may increase blood glucose levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil	Eugenol	Antistress; anti-inflammatory; antioxidant
	Linalool	Analgesic
	Alpha-pinene; Sabinene; Limonene; Piperidine; Cineole; Camphene; Phenylhydrazine; Geraniol	Bactericidal
	Alpha-Phellandrene, Beta-Pinene (Sangun et al, 2007).	
Nandergine		
Lactone	Costunolide; Laurenobiolide	
Catechin		
Proanthocyanidin		
Launobine		
Boldine		
Alkaloid	Reticulin	
Isodomesticine		
Neolitsine		

Client Considerations

Assess

- Assess the reason the client is using this product.
- Assess diabetic clients' use of insulin or antidiabetics; monitor blood glucose levels (see Interactions).
- Assess for symptoms of hypoglycemia or hyperglycemia.

Administer

- Instruct the client to take bay PO with a diabetic diet to enhance hypoglycemia.

Teach Client/Family

- Until more research is available, caution the client not to use bay during pregnancy and breastfeeding. Do not give bay to children.
- Advise the client not to use bay concurrently with oral antidiabetics or insulin; hypoglycemia may occur.

Bayberry

(bay'beh-ree)

Scientific name: *Myrica cerifera*

Other common names: Candleberry, myrica, wax myrtle, spicebush, sweet oak, tallow shrub, vegetable tallow, waxberry, wax myrtle

Origin: Bayberry is a shrub found in the southern and eastern regions of the United States.

= Pregnancy = Pediatric = Alert = Popular Herb

Uses

Traditionally, bayberry has been used internally to treat diarrhea, jaundice, coughs, and colds, as well as to induce emesis, as an antipyretic, and for uterine bleeding. Topically, it is used to treat skin conditions (such as varicose veins, hemorrhoids) and ulcers, and to promote wound healing. It is also used as a douche for treatment of leukorrhea. Bayberry may be used as a gargle to relieve sore throats and gums. Contemporary use is eclectic. Bayberry is mostly used as an adjunct in formulas.

Actions

Almost no primary research is available on bayberry. Its possible actions include antipyretic and antibacterial effects (Paul, 1974). It is a stimulating, warming astringent with action similar to that of cinnamon. Choleretic activity and mineralocorticoid effects have also been reported (Duke, 2003). After bioassay, *Myrica cerifera* showed increased antithrombin activity (Chistokhodova et al, 2002).

Product Availability

Capsules: 450, 475 mg; fluid extract; tea

Plant Parts Used: Dried root bark, flowers

Dosages

Skin Conditions

- Adult topical: apply prn as a wash made by decoction

Sore Throat

- Adult gargle: use diluted in water (Smith, 2007), up to 3×/day

Other

- Adult PO cold infusion: 2-4 oz tid (Moore, 1996)
- Adult PO fluid extract: 1-3 ml tid (either 1:2 or 1:5 dilution) (Moore, 1996)
- Adult PO capsules: 1 cap up to 3×/day

Contraindications

Class 1 herb.

Until further research is available, bayberry is not recommended for internal use during pregnancy and breastfeeding. It should not be given to children. Plant parts should not be consumed; hepatotoxicity can occur.

Side Effects/Adverse Reactions

CV: Hypertension, weight gain, hypernatremia

GI: Nausea, vomiting, anorexia, gastric irritation, *hepatotoxicity*

SYST: Allergic rhinitis, hypersensitivity, *possible malignancies (injectable form)*

Interactions

Drug

Antihypertensives: Bayberry's tannin content may increase sodium and water retention (Jellin et al, 2008).

Primary Chemical Components and Possible Actions*

Chemical Class	Individual Component	Possible Action
Tannin		Astringent; wound healing; antiinflammatory
Flavonoid glycoside	Myricitrin	Bile stimulant
Triterpene	Myricadiol Myricalactone Myrica acid Taraxerol; Taraxerone Palmitic acid; Lauric acid	Mineralocorticoid; antibacterial
Gum		
Starch		
Volatile oil		

*The constituents have not been reported to any great extent in primary research.

Client Considerations

Assess

- Assess the reason the client is using this product.
- Assess for cardiovascular disease (hypertension, tachycardia); monitor blood pressure, pulse, and weight weekly; monitor electrolytes.
- Assess for hepatic disease; avoid use in hepatic disease.
- Assess client's weight and for edema; mineralocorticoid effect may occur.

Administer

- Instruct the client to take bayberry fluid extract PO.
- Instruct the client to apply topically as needed. A hot compress can be made by pouring hot bayberry tea on a towel.

Teach Client/Family

- Caution the client not to use bayberry in children or those who are pregnant or breastfeeding until more research is available.
- Advise the client that excessive use of bayberry in large doses can cause nausea and vomiting.

Bearberry

(behr'beh-ree)

Scientific names: *Arctostaphylos uva-ursi, Arctostaphylos coactylis, Arctostaphylos adenotricha*

Other common names: Arctostaphylos, bear's grape, crowberry, foxberry, hogberry, kinnikinnick, manzanita, mountain box, rockberry, uva-ursi

Origin: Bearberry is an evergreen found in rocky, mountainous regions.

= Pregnancy = Pediatric = Alert = Popular Herb

Uses

Bearberry exerts antimicrobial effects against *Escherichia coli, Proteus vulgaris, Enterobacter aerogenes, Streptococcus faecalis, Staphylococcus aureus, Salmonella typhi,* and *Candida albicans.* Bearberry traditionally has been used as a diuretic (it is especially effective in cases of highly acidic urine), an antiinflammatory, and an astringent. Contemporarily, it is used as a decoction to treat urinary tract infections. Bearberry may be useful in premenstrual bloating.

Actions

Little primary research is available detailing the mode of action of bearberry.

Antiseptic/Diuretic Action

The diuretic effect of bearberry results from both its triterpene chemical components and arbutin, a hydroquinone. These components stimulate diuresis.

Antiinflammatory Action

One of the flavonoid components of bearberry, quercitrin, is responsible for decreased inflammation. Arbutin and urosolic acid may also be responsible for its antiinflammatory effects (Jahodar et al, 1985).

Antimicrobial Action

Research on the antimicrobial effect of bearberry has focused on arbutin. Arbutin has been reported to be effective as a diuretic and as a urinary antiseptic in moderate doses, but only if the urine is alkaline. Use of the whole plant is most effective because of the combined effects of arbutin and gallic acid, another chemical component (Constantine et al, 1966; Leung, Foster, 1996). Urosolic acid has been found to be effective against gram-positive and gram-negative bacteria and yeast (Kowalewski et al, 1976; Zaletova et al, 1986). *Arctostaphylos uva-ursi* has been shown to be effective against methicillin-resistant *Staphylococcus aureus* (Shimizu et al, 2001). Bearberry has shown an inhibitory effect against *Arcobacter butzleri, A. cryaerophilus,* and *A. skirrowii* (Cervenka et al, 2006). Methanol extracts showed strong antimicrobial activity.

Product Availability

Dried leaves, drops, fluid extract, powdered extract, tablets, tea

Plant Part Used: Dried leaves

Dosages

- Adult PO fluid extract: 3-12 ml/day of a 1:1 dilution (Mills, Bone, 2005)
- Adult PO freeze dried leaves: 500-1000 mg tid
- Adult PO infusion: 1.5-4 g (1-2 tsp), infuse in cold water to decrease tannin extraction, take 1 cup tid
- Adult PO powdered solid extract: 250-500 mg (expressed as 10% arbutin, one of the chemical components of bearberry) tid
- Adult PO tincture: 6-12 ml/day of a 1:5 dilution (Mills, Bone, 2005)

Contraindications

Pregnancy category is 5; breastfeeding category is 4A.

Bearberry should not be given to children younger than 12 years of age. Hepatotoxicity may occur in pediatric patients. Bearberry should be used cautiously by persons with electrolyte imbalances, renal disease, acidic urine, constipation, iron

Continued

Contraindications—cont'd

deficiency, anemia, malnutrition due to high tannin level, and disorders involving gastrointestinal irritation. It is not intended for prolonged use unless used under the direction of an experienced herbalist.

Side Effects/Adverse Reactions

In very high doses only.
GI: Nausea, vomiting, anorexia, *hepatotoxicity*
GU: Discolored urine (dark green)
INTEG: Cyanosis
Toxicity: *Tinnitus, vomiting, seizures, cardiovascular collapse, delirium, shortness of breath, feeling of suffocation*

Interactions

Drug

Diuretics: Concurrent use of bearberry and diuretics can lead to electrolyte loss, primarily hypokalemia.
NSAIDs: Bearberry may increase the effect of NSAIDs.
Urine acidifiers: Urine acidifiers may inactivate bearberry; do not use concurrently.

Pharmacology

Pharmacokinetics

Very little is known about the pharmacokinetics in humans. In one study examining the pharmacokinetics of the chemical components of bearberry, six healthy clients drank a tea made from uva-ursi and their urine was subsequently analyzed. After 3 hours, 53% of the arbutin equivalents were recovered in the urine, and after 3 to 6 hours, another 14% of the other hydroquinones were excreted (Paper et al, 1993).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Hydroquinone	Arbutin	Antiseptic; astringent; antiinflammatory; antibacterial, antifungal
	Methylarbutin	
	Corilagin	Antibacterial
	Monoglucoside; Methylarbutin	
Tannin	Gallo; Ellgic; Condensed	
Triterpene		Diuretic
Iridoid monoterpene	Monotropein	
Piceoside		
Phenol carboxylic acid	Gallic acid	
Flavonoid	Quercitrin	Antiinflammatory
	Myricitrin; Hyperoside	
Volatile oil		

Client Considerations

Assess

- Determine the reason the client is using bearberry.
- Assess for the use of urinary acidifiers and diuretics. If the client is using diuretics, monitor electrolytes (see Interactions).
- Assess urine alkalinity. Urine may need to be alkaline in order for bearberry to be effective.
- Assess for signs and symptoms of toxicity: tinnitus, vomiting, seizures, change in cardiovascular status, hepatotoxicity.

Administer

- Instruct the client to take dried leaves PO. The berries should not be used.

Teach Client/Family

- Inform the client that pregnancy category is 5 and breastfeeding category is 4A.
- Caution the client not to use bearberry in children younger than 12 yr of age.
- Advise client that bearberry may turn urine green-brown.

Bee Pollen

(bee pah'lun)

Scientific name: *Apis mellifera* (source organism)

Other common names: Buckwheat pollen, maize pollen, pine pollen, pollen pini, puhuang, rape pollen, royal jelly, songhuafen, typha pollen

Origin: Bee pollen is available throughout the world.

Uses

Bee pollen is used to treat asthma, prostatitis, impotence, bleeding gastric ulcers, and high altitude sickness. It is also used to desensitize allergies and to increase appetite immunogenic effects and energy level thereby combating fatigue and depression. Topically, bee pollen is used in skin products and for skin disorders such as eczema and diaper rash (Jellin et al, 2008).

Investigational Uses

Studies are underway to determine the effectiveness of bee pollen in treating cancer, menopausal symptoms, hypercholesteremia, and heart disease.

Actions

Bee pollen has been used for many years as a food source in times of scarcity. Its high nutrient content can sustain people and animals when food is not available.

Gastric Protective Action

In a study of patients with bleeding gastric ulcers (Georgieva et al, 1971), 40 patients were given 250 mg of bee pollen bid. The patients exhibited a positive response, with ulcers showing signs of healing.

Altitude Sickness Prevention

Chinese research has investigated the use of bee pollen to prevent altitude sickness by testing rats and mice exposed to low partial-pressure oxygen to simulate 12,000 meters above sea level. Some rats and mice were given no bee pollen, while others were fed various bee pollen species. Those fed bee pollen proved to have a higher survival rate than those not fed bee pollen. In another 2-year study using humans (Peng et al, 1990), some participants were given bee pollen over a period of 3 to 7 days before a change in altitude to more than 5000 meters above sea level. As compared with individuals who received no bee pollen, these individuals showed either no adverse reaction or a greatly lessened reaction to the rise in altitude. Thus bee pollen appears to increase the ability to adapt to a high-altitude environment.

Antiallergy Action

In folk medicine, bee pollen is sometimes given to individuals with allergies to stimulate desensitization.

Other Actions

Fifty-five postmenopausal women with menopausal symptoms were treated with Melbrosia for 3 months. Menopausal evaluation tool and psychological questionnaires were given and cardiovascular disease markers in blood were evaluated at the beginning and end of the study. There was a significant reduction in the Kupperman score, Zerssen's Symptoms List, and Zung Depression Score (Georgiev et al, 2004).

Product Availability

Bars; capsules: 500, 1000 mg; granules: 300 mg; liquid; tablets: 500, 1000 mg; wafers; source: bee pollen is a combination of flower pollen, nectar, and the digestive juices of the worker honeybee *Apis mellifera.*

Dosages

- Adult PO: 500-1000 mg tid ½ hr before meals

Contraindications

Bee pollen should not be used by persons with pollen allergy or diabetes. Persons with known pollen allergy should be tested for allergic reaction before using bee pollen products. Avoid use in hepatic disease.

Side Effects/Adverse Reactions

GI: Nausea, diarrhea, vomiting, anorexia, *hepatotoxicity, acute hepatitis* (Jellin et al, 2008)
INTEG: Rash, allergic reactions, hypersensitivity
SYST: *Anaphylaxis*

Interactions

Drug

Antidiabetics, insulin: Bee pollen decreases the effectiveness of insulin, antidiabetics, and increases hyperglycemia; do not use concurrently.

Lab Test

PT, ALT, AST, LDH, bilirubin, alkaline phosphatase: Bee pollen may increase these tests.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Protein		
Carbohydrate	Glucose; Fructose	
Mineral		
Fatty acid	Alpha-linolenic acid; Linolenic acid	
Vitamin	B complex; C	
Flavonoid		
Phytosterin		
Nicotinic acid		
Riboflavin		
Ash		

Client Considerations

Assess

- Assess the reason the client is using this product.
- Assess for allergies to bee pollen before using; anaphylaxis may occur. Client should be tested for an allergic reaction to the particular bee pollen to be used.
- Assess for hepatic disease and diabetes; avoid use in these conditions.
- Assess the client for use of antidiabetes agents or insulin; bee pollen may decrease the effectiveness of these products (see Interactions).

Administer

- Instruct the client to take bee pollen PO before meals.
- Instruct the client to store bee pollen in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that bee pollen may be used during pregnancy and breastfeeding, and may be given to children.
- Caution the client that allergic reactions can be severe in individuals with sensitivity to bee pollen.
- Instruct clients taking oral antidiabetes agents or insulin to monitor blood glucose often.

Benzoin

(behn′zuh-wun)

Scientific names: *Styrax benzoin, Styrax paralleloneurus, Styrax tonkinesis*

Other common names: Benjamin tree, benzoe, benzoin tree, gum benjamin, Siam benzoin, Sumatra benzoin

Origin: Benzoin is a resin from the trees of genus *Styrax.*

Uses

Benzoin is used topically to promote wound healing and as an antiseptic, a mucosal protectant, and an adhesive. It is also used as an expectorant and as an inhalant for bronchial disorders.

Actions

Benzoin has been used topically for many years as an antiseptic and a skin protectant. However, many other products are just as effective. There is little evidence for its other uses.

Product Availability

Cream, lotion, ointment, tincture

Plant Part Used: Bark gum resin

Dosages and Routes

- Adult and child inhalant: 5 ml benzoin gum/1 pt water; breathe vapors or place tincture directly on handkerchief (Jellin et al, 2008)
- Adult and child topical: may be applied to the affected area q2hr-q4hr; test a small area before applying to larger area; a few drops of benzoin tincture q2hr (Jellin et al, 2008)

Contraindications

Class 1 herb.

Benzoin should not be used internally or by those with hypersensitivity to this herb.

Side Effects/Adverse Reactions

GI: Gastritis, *gastrointestinal hemorrhage* (ingestion)
INTEG: Rash, allergic reactions, hypersensitivity, contact dermatitis
RESP: Asthma (inhalation)
SYST: *Anaphylaxis*

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Acid	Benzoic acid Cinnamic acid	Antiseptic; protectant

Client Considerations

Assess

- Assess for hypersensitivity reactions, including anaphylaxis. Benzoin use should be discontinued if any hypersensitivity reactions occur.
- Assess for gastrointestinal bleeding: dark tarry stools, frank blood, gastritis, abdominal pain; do not use internally.

Administer

- Instruct the client to use benzoin as a topical or an inhalant only; skin may become discolored.

Teach Client/Family

- Caution the client that gastritis and gastrointestinal hemorrhage can occur if benzoin is taken internally.

Beta-Carotene

(bay′tuh kare′uh-teen)

Scientific names: *Beta-Carotene*

Other common names: A-Beta-Carotene, Betacarotene, Carotenes, caroentoids, provitamin A

Origin: Beta-carotene is available naturally in fruits and vegetables. Synthetically, it may be manufactured from fungi or algae.

Uses

Beta-carotene is used for erythropoietic protoporphyria (EPP); age-related macular degeneration (AMD); breast, gastric, ovarian, prostatic, and colorectal cancer; exercise-induced asthma; osteoarthritis; sunburn; cervical dysplasia; and hypertension.

Actions

Anticancer Action

Beta-carotene is a vitamin A precursor and antioxidant. It is thought to reduce the risks of cancer. However, two double-blind, placebo-controlled studies with approximately 50,000 subjects found an increased risk of cancer over that in the placebo controlled group (Albanes, 1995; Omenn, 1996). When the study was reviewed, many of the subjects were found to be smokers. Therefore, as noted above, smokers should not use increased beta-carotene. There are numerous other studies in support of beta-carotene for preventing cancers, including gastric and breast (Jellin et al, 2008).

Action Against Age-Related Macular Degeneration

There are many studies (Age-Related Eye Disease Study Research Group, 2001; West, 1994) that identify the beneficial effects of beta-carotene in age-related macular degeneration, especially when combined with other supplements such as zinc, vitamin C, and vitamin E.

Product Availability

Tablets, capsules

Plant Parts Used: Whole fruit or vegetable

Dosages

AMD

- Adult PO: 15 mg beta-carotene given with 500 mg vitamin C, 80 mg zinc oxide, and 400 units vitamin E daily

Contraindications

Beta-carotene should not be used after angioplasty, or in those who have asbestos exposure or those who smoke.

Side Effects/Adverse Reactions

INTEG: Yellow-orange skin color

Continued

Interactions

Drug

Alcohol, bile acid sequestrants, colchicine, mineral oil, neomycin (PO), olestra, orlistat, proton pump inhibitors: Beta-carotene is decreased by these agents.

Lab Test

HDL-2: Beta-carotene may decrease HDL-2 levels.

Client Considerations

Assess

- Assess the reason the client is using beta-carotene.
- Identify if the client has been exposed to asbestos, has had an angioplasty recently or is a smoker, since these persons should not supplement beta-carotene.
- Identify if the client is using alcohol, olestra, bile acid sequestrants, mineral oil, neomycin (PO), orlistat, proton pump inhibitors, since these agents decrease beta-carotene levels.

Administer

- Keep beta-carotene in a dry area, away from direct sunlight.

Teach Client/Family

- Teach the client that beta-carotene supplements should not be used in those who have recently had angioplasty, who have been exposed to asbestos, or who smoke.

Betel Palm

(bee′tul pahlm)

Scientific name: *Areca catechu*

Other common names: Areca nut, betal, betal nut, chavica betal, hmarg, maag, paan, pan masala, pan parag, pinang, pinlag, supai

Origin: Betel palm is a palm found in China, India, the Philippines, and the tropical regions of Africa.

Uses

Betel palm is used to treat depression, schizophrenia, respiratory conditions, cough, and sore throat. It is also used as a psychostimulant and digestive aid. Betel palm is used recreationally as a CNS stimulant.

Actions

Psychiatric Action

Betel has been used for centuries in Asia as a psychostimulant. However, studies of the rat brain have shown that betel inhibits monoamine oxidase (MAO). The aqueous fraction is the most potent inhibitor of MAO-A. Several older studies have also demonstrated the antidepressant action of betel palm (Dar et al, 1997; Van der Hyden et al, 1987). Betel chewing is shown to decrease symptomatology in schizophrenia (Sullivan et al, 2000).

Parasympathetic Nervous System Action

Betel palm has been shown to increase muscarinic action, salivation, and central nervous system stimulation in mice. When chewed, betel palm also lowers heart rate and induces euphoria.

Thyroid Function Action

A study of mice given betel leaf extract demonstrated a dual role on thyroid function (Panda et al, 1998). At high doses, the leaf extract increased T_4 (thyroxine) and decreased T_3 (triiodothyronine), whereas at lower doses the opposite was true. High doses also increased lipid peroxidation. Thus, betel leaf has been shown to produce both inhibitory and stimulatory effects on thyroid function.

Product Availability

Leaves, nut, pressed juice

Plant Parts Used: Leaves, nut

Dosages

Sore Throat

- Adult PO gargle: use prn

Other

- Adult PO: 2 g fresh nut, chew for 15 min or more and spit out
- Adult PO: roll leaves and place between teeth and gums/lips

Contraindications

Betel palm should not be used during pregnancy and breastfeeding, and should not be given to children. Clients with oral or esophageal cancers, ulcers, esophagitis, or renal disease should avoid its use.

Side Effects/Adverse Reactions

CNS: Stimulation, facial flushing, fever, dizziness, *seizures*, acute psychosis, anxiety, insomnia, restlessness

CV: Palpitations, *tachycardia or bradycardia*

EENT: Red stains on teeth, oral leukoplakia, oral submucosal fibrosis, *oral carcinogenesis* (chewing) (Chen et al, 1999; Norton, 1998; Molin et al, 2007), blurred vision

GI: Nausea, vomiting, diarrhea or constipation, red feces, abdominal cramping/pain; *intestinal epithelial cell lining alteration* (Kumar et al, 2000)

RESP: Increased asthma symptoms

Interactions

Drug

Alcohol: Betel palm increases the effects of alcohol; do not use concurrently.

Antiglaucoma agents: Betel palm decreases the action of antiglaucoma agents; do not use concurrently.

Beta-blockers, calcium channel blockers, cardiac glycosides (digoxin): Betel palm increases the action of beta-blockers, calcium channel blockers, cardiac glycosides; do not use concurrently.

Cholinergics: Betel palm may increase the effects of cholinergics; avoid concurrent use (Jellin et al, 2008).

MAOIs: Betel palm may increase chance of hypertensive crisis.

Continued

Interactions—cont'd

Neuroleptics: Extrapyramidal symptoms can occur when betel palm is combined with neuroleptics; do not use concurrently (Fugh-Berman, 2000).

Food

Tyramine foods: Betel palm may increase the chance of hypertensive crisis.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid	Arecoline	Parasympathomimetic; sympathomimetic; monoamine oxidase inhibitor
	Arecaidine; Arecaine; Arecolidine; Guvacine; Guvacoline; Isoguvacine	
Phenol		
Volatile oil	Chavicol; Chaibetol; Cadinene; Allylpyrocatechol	
Tannin	Catechin type	Wound healing; antiinflammatory

Client Considerations

Assess

- Check the client's mouth for changes such as leukoplakia and fibrosis.
- Assess for cardiac arrhythmias, milk-alkali syndrome, asthma, and central nervous system changes.
- Assess for medications used by the client: antiglaucoma agents, beta-blockers, calcium channel blockers, cardiac glycosides, cholinergics, MAOIs, neuroleptics (see Interactions).
- Assess for alcohol use.

Administer

- Betel palm PO is used as either the fresh nut, which is chewed or used as a gargle, or the leaves. However, there are many dangerous side effects.

Teach Client/Family

- Caution the client not to use betel palm in children or in those who are pregnant or breastfeeding.
- Caution the client that chewing the root over long periods of time can lead to mouth fibrosis and oral carcinoma.

Bethroot

(bayth rewt)

Scientific names: *Trillium erectum, Trillium grandiflorum*

Other common names: Birthroot, cough root, ground lily, Indian balm, Indian shamrock, Jew's harp, purple trillium, rattlesnake root, snake bite, squaw root, stinking benjamin, three-leafed trillium, trillium pendulum, wake-robin

Origin: Bethroot is a member of the lily family found in Canada and parts of the United States.

Uses

Bethroot is used externally to treat insect bites, hemorrhoids, hematomas, varicose veins, and ulcers. It is used as a douche to treat leukorrhea. Internally, bethroot is used to relieve pain and treat dysmennorrhea and heavy menses (Jellin et al, 2008). Traditionally, bethroot has been used as an expectorant and to treat bleeding, snake bites, and skin irritation. This plant is on the endangered species list in many states and therefore should not be harvested from the wild.

Actions

Very little research is available for bethroot.

Astringent Action

The astringent activity of bethroot may account for its ability to control bleeding by constricting the blood vessels (Duke, 2003). This may be the result of the chemical component saponin.

Antifungal Action

The saponins in bethroot are believed to exert significant antifungal effects (Duke, 2003).

Product Availability

Extract, powder, powdered root

Plant Parts Used: Leaves, rhizome, roots

Dosages

Astringent/Expectorant

- Adult PO fluid extract: 30 minims

Bleeding

- Adult PO tincture: 1-3 ml q 15 min, up to 4 doses daily

Other

- Adult PO powder: 1 tsp powder/1 pt water prn

Contraindications

Class 2b herb.

Because it can cause uterine stimulation, bethroot should not be used during pregnancy. It should not be given to children or used during breastfeeding until more research is available.

Side Effects/Adverse Reactions

CV: *Cardiotoxicity—change in blood pressure, pulse, ECG*

GI: Nausea, vomiting, anorexia, gastrointestinal irritation, abdominal cramping

HEMA: Constriction of blood vessels

Continued

Interactions

Drug

***Cardiac glycosides** (digoxin):* Bethroot may decrease the effects of cardiac glycosides; use together cautiously.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Saponin	Trillin; Trillarin; Kryptogenin; Chlorogenin; Nologenin	Astringent; expectorant, antifungal
Glycoside	Convallamerin-like	Cardiotoxicity
Tannic acid starch		

Client Considerations

Assess

- Assess the reason the client is using this product.
- Assess for cardiotoxicity: monitor blood pressure, pulse, and changes in cardiac status.
- Assess for use of cardiac glycosides (see Interactions).
- Assess for change in respiratory status (expectorant use) or decrease in surface bleeding.

Administer

- Instruct the client to take bethroot PO as a tincture or an expectorant.
- Store bethroot in a cool, dry, place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use bethroot during pregnancy because it can induce labor. Until more research is available, caution the client not to use this herb during breastfeeding and not to give it to children.

Betony

(beht'nee)

Scientific name: *Stachys officinalis* L. (Trevisan)

Other common names: Bishopswort, wood betony

Origin: Betony is a member of the mint family found in the southern and western regions of Europe and Siberia.

Uses

Betony is used to treat seizures, palpitations, diarrhea, asthma, headaches, anxiety, bronchitis, wounds, renal stones, and hypertension.

Actions

Very little research exists for betony.

Antihypertensive Action

The antihypertensive effect of betony may result from glycosides present in the herb. Stachydrine, one of the chemical components in this herb, is a systolic depressant.

Other Actions

The astringent and antidiarrheal actions of betony are a result of its high tannin content.

Product Availability

Capsules, tea, tincture

Plant Parts Used: Flowers, leaves

Dosages

- Adult PO tea, infusion, gargle, or smoked
- Adult PO tincture: 2-4 ml bid-tid

Contraindications

Class 1 herb.

Because uterine stimulation can occur, betony should not be used during pregnancy. Do not give this herb to children, and avoid using it during breastfeeding until more research is available.

Side Effects/Adverse Reactions

GI: *Hepatotoxicity*, gastrointestinal irritation, nausea, anorexia

Interactions

Drug

Antihypertensives: The hypotensive effects of betony may increase the action of antihypertensives; avoid concurrent use.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Tannin		Astringent; antidiarrheal; wound healing; antiinflammatory
Flavonoid		
Glycoside	Stachydrine	Systolic depressant
	Betaine; Betonicide; Acetoside; Campneoside; Forsythoside B	
Leucosceptoside B		

Client Considerations

Assess

- Assess the reason the client is using this product.
- Assess the client's use of antihypertensives; monitor blood pressure, pulse, and character (see Interactions).
- Assess hepatic function test results (AST, ALT, bilirubin) to identify hepatic damage. If hepatic function levels are increased, discontinue use of this herb.

Administer

- Instruct the client to take betony PO as a tea, tincture, or infusion.
- Instruct the client to store betony in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Because it can stimulate the uterus, caution the client not to use betony during pregnancy (Chevallier, 1996). Advise the client to avoid the use of this herb during breastfeeding and to avoid giving it to children until more research is available.
- Advise the client to use small doses, as large doses can cause significant GI irritation (Jellin et al, 2008).

Bilberry

(bil'beh-ree)

Scientific name: *Vaccinium myrtillus*

Other common names: Airelle, bilberry, black whortle, bleaberry, bog bilberry, European blueberry, huckleberry, trackleberry, whinberry, whortleberry

Origin: Bilberry is found in the central, northern, and southeastern regions of Europe.

Uses

Bilberry has been used to improve night vision; to prevent cataracts, macular degeneration, and glaucoma; to treat varicose veins and hemorrhoids; to prevent hemorrhage after surgery; and to prevent and treat diabetic retinopathy and myopia. Other uses for bilberry include decreasing diarrhea, dyspepsia in adults or children, controlling insulin levels, as a diuretic and as a urinary antiseptic.

Actions

Research is more extensive for bilberry than for many other commonly used herbs. Areas of research include the use of bilberry for treating circulatory disorders, glaucoma, cataracts, macular degeneration, poor night vision, and diabetic/hypertensive retinopathy. Studies have also focused on its use as an antilipemic.

Ophthalmologic Action

Studies indicate that night vision improved significantly when individuals were given bilberry. Participants experienced improved night visual acuity, improved adjustment to darkness, and restoration of acuity after glare. Further research has confirmed the findings of the previous studies (Muth et al, 2000). These actions may be due to the affinity of bilberry for the retina. In addition, bilberry may be useful for the prevention and treatment of glaucoma, cataracts, and macular degeneration of the eye (Bravetti, 1989). Chemical components in bilberry may alter the collagen structure

of the eye and decrease intraocular pressure. The collagen-stabilizing effects of *Vaccinium* may offer protection against glaucoma and the development of cataracts and macular degeneration of the eye.

Antidiabetic Action

The anthocyanoside components of bilberry have been shown to decrease hyperglycemia in dogs (Bever et al, 1979). Their effect is somewhat weaker than that of insulin. However, a single dose has an extended duration of up to several weeks (Bever et al, 1979).

Other Actions

Some of the other proposed actions of bilberry include its lipid-lowering effect and its ability to treat inflammatory joint disease, microscopic hematuria, and varicose veins. Studies in rats have shown that the anthocyanosides promote collagen synthesis and inhibit collagen loss. Bilberry also has been studied for its antioxidant effect (Milbury et al, 2007; Bao et al, 2008).

Product Availability

Capsules: 60, 80, 120, 450 mg; fluid extract; fresh berries, dried berries; liquid; tincture; dried roots, dried leaves

Plant Parts Used: Berries, roots, leaves

Dosages

Cataracts

- Adult PO extract: 40-80 mg standardized to 25% anthocyanosides (anthocyanadin) tid (Murray, Pizzorno, 1998)

Diabetes Mellitus

- Adult PO extract: 80-160 mg standardized to 25% anthocyanosides tid (Murray, Pizzorno, 1998)

Glaucoma

- Adult PO extract: 80 mg standardized to 25% anthocyanosides tid (Murray, Pizzorno, 1998)

Other

- Adult PO fresh berries: 55-115 g tid
- Adult topical decoction: ⅛-¼ ounce (5-8 g) of crushed dried fruit in 150 ml of water, boil 10 min, strain, use warm
- Adult gargle/mouthwash: prepare decoction 10%, rinse or gargle

Contraindications

Pregnancy category is 1; breastfeeding category is 2A.

Bilberry has been used traditionally to help stop breastfeeding (Blumenthal, 1998). Avoid large doses in those with clotting/bleeding disorders.

Side Effects/Adverse Reactions

GI: Constipation (large consumption of dried fruits)

Interactions

Drug

Anticoagulants *(heparin, warfarin)*, ***NSAIDs:*** Bilberry may increase the action of anticoagulants, NSAIDs; use caution if taking concurrently.

Continued

Interactions—cont'd

Antidiabetics: Bilberry may increase hypoglycemia; use caution if taking concurrently.
Antiplatelet agents: Bilberry may cause antiaggregation of platelets; use caution if taking concurrently.
Aspirin: Bilberry may increase the anticoagulation action of aspirin; use caution if taking concurrently.
Insulin: Bilberry leaves may significantly decrease blood glucose levels; monitor carefully.
Iron: Bilberry interferes with iron absorption; avoid concurrent use.

Herb

Hypoglycemic herbs *(devil's claw, fenugreek, garlic, horse chestnut, ginseng [Panax, Siberian]):* Bilberry may increase hypoglycemic effect when used with hypoglycemic herbs (Jellin et al, 2008).

Lab Test

Blood glucose: Bilberry may decrease blood glucose.

Pharmacology

Pharmacokinetics

Peak 15 minutes; eliminated via bile. Therapeutic properties vary by harvest area (Burdulis et al, 2007).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Tannin		Astringent; antiinflammatory; antidiarrheal
Flavonoid	Cinnamic acid; Benzoic acid	
Acid, phenolic, organic		
Pectin		
Anthocyanosides		Antioxidant; increased circulation; anti-aggregation of platelets; antianginal; antiulcerative; gastroprotective
Rutin		Lowered intraocular pressure
Disaccharides	Delphinidin, Cyanidin (Du et al, 2004)	

Client Considerations

Assess

- Assess whether the client is taking anticoagulants, antidiabetic agents, or antiplatelet agents. Bilberry is known to induce hypoglycemia, anticoagulation, and antiplatelet aggregation (see Interactions).

- Monitor improvement in vision if using to treat cataracts or glaucoma.
- Monitor blood glucose if using to treat diabetes mellitus.

Administer

- Instruct the client to take bilberry PO in the form of tincture, capsules, fluid extract, or fresh berries.

Teach Client/Family

- Inform the client that pregnancy category is 1 and breastfeeding category is 2A.
- Advise the client to notify the herbalist if diarrhea persists for more than 4 days.
- Advise the client that use of higher-than-recommended doses or use of this herb for extended periods will result in toxicity, and may result in death (leaves).

Birch

(burch)

Scientific names: *Betula alba, Betula pendula, Betula verrucosa, Betula pubescens, Betula lenta*

Other common names: Birch tar oil, birch wood oil, black birch, cherry birch, sweet birch oil, white birch

Origin: Birch is found in Russia, throughout Europe, and in the eastern region of the United States.

Uses

Birch is used internally as an analgesic, a diuretic, and to treat urinary stones and gout. It is also used as a topical treatment for arthritic joints, aching muscles, and muscle spasms. Birch can also be applied externally for sores and boils.

Investigational Uses

Studies are underway to determine the effectiveness of birch as an antioxidant used to decrease free radicals and as a prostate cancer treatment.

Actions

Almost no research is available on birch. Existing information on its uses comes from anecdotal evidence taken from traditional herbal medicine. However, birch is thought to possess significant antioxidant activity (Matsuda, 1998), and one study investigated its diuretic effects (Bisset, 1994). A newer study discussed in Saxena (2006) identified the use of birch bark in prostate cancer. Preliminary tests show that betulonic acid, from betulinol, discourages human prostate cancer cells from dividing and allows those cells to die.

Product Availability

Decoction, dried bark, essential oil, tea

Plant Parts Used: Bark, leaves, twigs

Dosages

- Adult PO tea: boil 2-3 g (Blumenthal, 1998) bark and twigs for 1 hr; strain; use tid
- Adult topical: apply only to area to be treated; to prevent contact dermatitis, do not apply essential oil to broken skin

Contraindications

Class 1 herb.

Until more research is available, birch should not be used internally by persons who are pregnant or breastfeeding, and should not be given to children. Birch should not be used by persons with hypersensitivity to it or with other allergic conditions, or by persons with congestive heart failure, hypertension (Jellin et al, 2008), or severe kidney disease.

Side Effects/Adverse Reactions

SYST: Allergic reactions

Interactions

Drug

Diuretics: Birch may decrease the action of diuretics.

Herb

Celery: Birch used with celery may cause cross-sensitization.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Flavonoid	Quercetin	Antioxidant; antiinflammatory
	Hyperoside; Avicularin	
Birch tar oil		
Turpentine oil		
Creosol		
Betulin		Antitumor action; anticancer action
Tannin proanthocyanidins		Diuretic

Client Considerations

Assess

- Assess the reason the client is using this product.
- Assess for allergic reactions, rash, wheezing, and chest tightness. If present, administer antihistamine or other appropriate therapy.
- Monitor cardiac parameters, increased blood pressure.

Administer

- Instruct the client to take birch PO as a tea or infusion, or to apply topically.

Teach Client/Family

- Caution the client not to use birch internally in children or those who are pregnant or breastfeeding until more research is available.
- Because contact dermatitis may occur, advise the client to avoid direct skin contact with birch by using a carrier oil, to avoid use on broken skin, and to first test the oil on a small area.
- Keep sweet birch essential oil away from children. It may result in a fatal reaction when applied to the skin.

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Bistort

(bis-tawrt')

Scientific name: *Polygonum bistorta*

Other common names: Adderwort, common bistort, Easter ledges, Easter mangiant, knotweed, oderwort, osterick, patience dock, snakeroot, snakeweed, twice writhen

Origin: Bistort is found in Europe and is cultivated in North America.

Uses

Bistort is used externally to treat bites, stings, burns, snakebites, and hemorrhoids. It is used internally to treat peptic ulcers, irritable bowel syndrome, ulcerative colitis, and diarrhea.

Investigational Uses

Research is ongoing into the potential use of bistort as an antiviral to induce interferon-like activity.

Actions

In traditional herbal medicine, bistort has been used both internally and externally to treat a variety of conditions. Currently, research is focused on the antiviral and interferon activity of the *Polygonum* species. One study focused on the antiinflammatory action of bistort (Duwiejua et al, 1999). In this study, two compounds with significant antiinflammatory properties were isolated. Another study has shown a substance that is able to induce interferon-like activity (Smolarz et al, 1999). When bistort was evaluated (Manoharan et al, 2007) for cytotoxic activity against various cancers, it showed moderate to very good cytotoxic activity.

Product Availability

Powder, roots (cut and dried), tea

Plant Parts Used: Leaves, rhizome, roots

Dosages

- Adult PO: 1 tsp powdered root in 1 cup boiling water, take as often as tid
- Adult topical: use powder and water to make a poultice, apply to area prn

Contraindications

Class 1 herb.

Until more research is available, bistort should not be used during pregnancy and breastfeeding.

Side Effects/Adverse Reactions

GI: Gastrointestinal irritation, *hepatotoxicity*

Interactions

Drug

Oral drugs: Bistort given with oral drugs may cause precipitation of some drugs; separate by the longest period of time as practical (Jellin et al, 2008)

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Leaves Contain		
Tannin	Bistortaside A (Liu et al, 2006); Friedelanol (Duwiejua, 1999)	Wound healing; antiinflammatory; astringent, antidiarrheal
Phenol		
Roots Contain		
Flavonoids		
Starch		
Gallic acid		
Phlobaphene		
Anthranoide	Emodin	Laxative

Client Considerations

Assess

- Assess the reason the client is using this product.
- Assess the client's gastrointestinal symptoms (cramping, diarrhea, bleeding).
- Assess hepatic function test results; hepatotoxicity can occur.

Administer

- Instruct the client to take bistort PO no more often than tid.
- Instruct the client to use bistort topically as a poultice to decrease inflammation.

Teach Client/Family

- Until more research is available, caution the client not to use bistort during pregnancy and breastfeeding.

Bitter Melon

(bi'tur meh'lun)

Scientific name: *Momordica charantia* L.

Other common names: Balsam apple, balsam pear, bitter cucumber, bitter gourd, bitter pear, carilla cundeamor, karolla

Origin: Bitter melon is an annual and is cultivated in Africa, India, South America, and parts of Asia.

Uses

Bitter melon is used as an antipyretic, an anthelmintic, and a laxative. It may also be used for diabetics, ulcers, colitis, and renal stones.

Investigational Uses

Researchers are experimenting with the use of bitter melon as an antifungal and androgenic, as well as its use as a treatment for HIV and other viral infections, malaria, *Helicobacter pylori,* diabetes, and infertility.

Actions

Antidiabetes Action

Several studies have focused on the hypoglycemic effects of bitter melon (Oishi et al, 2007; Dans et al, 2007; Roffey et al, 2007; Harinantenaina et al, 2006). One study of 100 participants with moderated non–insulin-dependent diabetes showed a significant reduction in fasting and postprandial blood glucose levels with the use of bitter melon (Ahmed et al, 1999). The diabetic action of this herb is thought to result from its ability to increase the functioning of beta cells in the pancreas (Ahmed et al, 1998). Another study demonstrated that the mechanism of action of this herb could be attributed in part to the increased glucose utilization of the liver, rather than an insulin secretion effect (Sarkar et al, 1996).

Antiinfective Action

One study noted a marked inhibition of HIV-1 replication in participants with T-lymphocytes that were acutely but not chronically infected with HIV-1 (Zheng et al, 1999). Another study focused on the antimalarial effects of *M. charantia.* A total of 46 different plant species were studied in vitro for their antimalarial activity on *Plasmodium falciparum* chloroquine-resistant malaria. *M. charantia* was shown to be moderately effective, as were other species. However, another study showed no antimalarial effects for bitter melon (Ueno et al, 1996).

Product Availability

Aqueous extract, juice, tincture, fruit

Plant Parts Used: Fruit, leaves, seed oil, seeds

Dosages

- Adult PO aqueous extract: 15 g/day (Murray, Pizzorno, 1998)
- Adult PO juice: 2 oz/day (Murray, Pizzorno, 1998)

Contraindications

Because it may cause uterine contractions and bleeding, bitter melon should not be used during pregnancy. Bitter melon also should not be used during breastfeeding or by persons with hypersensitivity to it. When taken internally, the seeds are toxic to children.

Side Effects/Adverse Reactions

GI: Hepatotoxicity, nausea, vomiting, anorexia

Interactions

Drug

Oral hypoglycemics: Bitter melon may increase the effects of oral hypoglycemics; use together cautiously.

Lab Test

Blood glucose: Bitter melon may decrease test values (if taken with antidiabetics)

Glycosylated hemoglobin (A_1c): Bitter melon may decrease A_1c in diabetics after 7 wk of therapy (Jellin et al, 2008)

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Triterpenoid	Momordincines	Antifungal
Steroid glycoside	Momordin Charantin	Hypoglycemia
Polypeptide P_3		Hypoglycemia
Vicine		Toxicity
Proteins	Alpha, Beta-Momordarin	
Serine protease inhibitors	BGIA, BGTI	
Flavonoid aglycones	Taxifolin, Quercetin, Kaempferol Myritcetin, Luteolin, Isorhamnetin, Rhamnetin (Smolarz, 2002)	

Client Considerations

Assess

- Assess the reason the client is using this product.
- Assess blood glucose (both fasting and postprandial) while the client is taking this herb.
- Assess all medications taken by diabetic clients (see Interactions).
- Assess for gastrointestinal symptoms: nausea, vomiting, anorexia; if these occur, discontinue bitter melon.

Administer

- Instruct the client not to use the red arils (outer coverings) around the seeds if taking PO.

Teach Client/Family

- Caution the client not to use bitter melon during pregnancy; uterine stimulation and bleeding can occur. This herb should be avoided during breastfeeding.
- When taken internally, the seeds are toxic to children.

Bitter Orange

(bit'uhr owr'uhj)

Scientific name: *Citrus aurantium*

Other common names: Bigarade orange, nerol, Seville orange, sour orange

Origin: Bitter orange is grown in Asia and parts of the Mediterranean.

Uses

Bitter orange has been used traditionally as a sedative, an appetite stimulant, an insecticide for mosquitos, and for *Tinea* infections and dyspepsia. It is also used for anemia, kidney/bladder disorders, heart, and circulation. Topically bitter orange is used for inflammation of eyelids, conjunctivae, muscle pain, rheumatic pain, and phlibitis.

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Investigational Uses

Studies are underway for the use of bitter orange as a topical antifungal agent.

Actions

Antifungal Action

One study identifies bitter orange's possible topical antifungal action (Ramadan et al, 1996). The research discusses topical fungal infections such as tinea corporis, tinea cruis, and tinea pedis. There was a cure rate of 80% in the group treated with bitter orange oil. Very little research other than this study is available for the action of bitter orange. Bitter orange is being used by some individuals for weight loss (Haller 2005; Haaz 2006). Five weeks after bitter orange extract was studied in mice, there was increased liver antioxidant ability and change in liver histology (Jiao et al, 2007).

Product Availability

Fluid extract, tincture, tea

Plant Part Used: Fruit

Dosage

Weight Loss

- Adult PO extract: 975 mg with 900 mg St. John's wort and 528 mg caffeine per day (Jellin et al, 2008)

Fungal Skin Infections

- Adult topical: apply pure oil of bitter orange once a day for 1-3 wk (Jellin et al, 2008)

Contraindications

Bitter orange should not be used medicinally during pregnancy, breastfeeding, peptic ulcer disease, or those with angle-closure glaucoma, hypertension, or tachyarrhythmias. Children, or individuals using tanning beds or other ultraviolet light, should not use this herb.

Side Effects/Adverse Reactions

CNS: Anxiety, restlessness, nervousness, headache
EENT: Sore throat
GI: Anorexia, gastrointestinal upset, nausea
INTEG: Photosensitivity, skin redness, edema
MS: Gout

Interactions

Drug

Cytochrome P450 3A4 substrates *(calcium channel blockers, immunosuppressants, benzodiazepines, azole antifungals, macrolides, SSRIs):* Bitter orange can inhibit cytochrome P450 3A4 and increase drug levels (Jellin et al, 2008).
MAOIs: Bitter orange given with MAOIs may increase blood pressure (Jellin et al, 2008).

Lab Test

Blood glucose: Bitter orange may decrease blood glucose levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Hesperidin		Antifungal
Oxypeucedanin		Phototoxicity
Flavanoe Glycosides	Neohesperidin	
	Naringin	CNS stimulation; insomnia; hypertension
Volatile Oils	Limonene	
	Jasmone	
	Linalyl acetate	
	Geranyl acetate	
	Citronellye acetate	

Client Considerations

Assess

- Determine the reason the client is using bitter orange.
- Assess if the client is pregnant or breastfeeding or has been diagnosed with peptic ulcer disease.
- Assess for blood pressure, tachycardia, glaucoma; avoid use if present.

Administer

- Advise client to keep bitter orange in a cool, dry place.

Teach Client/Family

- Advise the client that bitter orange should not be used medicinally in children or those who are pregnant or breastfeeding until more research is available.
- Inform the client that gastrointestinal symptoms (nausea, anorexia, gastrointestinal upset) are common.
- Advise the client to use sunscreen and protective clothing or stay out of the sun to prevent burns. Caution the client not to use tanning beds while taking this herb.

Black Catechu

(blak cat'uh-shoo)

Scientific name: *Acacia catechu*

Other common names: Catechu wood extract

Origin: Black catechu grows wild in Asia, parts of Burma, and Eastern India. It is a naturalized tree in Jamaica.

Uses

Black catechu has been used traditionally for diabetes and hypertension, and topically for mouth ulcers such as stomatitis. Since it is an astringent and an antiseptic with a high tannin content, it is used for diarrhea, irritable bowel syndrome, and other gastrointestinal disorders. Black catechu is also used as a contraceptive.

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Actions

Very little research is available on the actions of black catechu. A few animal studies are available, but most information comes from anecdotal reports.

Antidiabetic Action

One study identified the hypoglycemic action of black catechu using animals (Singh et al, 1976).

Cardiovascular Action

One small study (Sham et al, 1984) identified the hypotensive action of this herb.

Other Actions

The other actions studied include contraception (Azad et al, 1984) and antineoplastic effect (Agrawal et al, 1990). The antineoplastic effect was tested on leukemic cells, including chronic myeloid, acute myeloblastic, acute lymphoblastic, and chronic lymphocytic. All types showed a marked reduction in leukemic cells. Black catechu is being studied for its antimicrobial action (Rani, 2004; Voravuthikunchai, 2004).

Product Availability

Dried extract, tea/infusion, tincture

Plant Part Used: Heartwood of the tree

Dosages

- Adult dried extract: PO 0.3-2 g tid or a single dose of 0.5 g
- Adult tea/infusion: 0.3-2 g of dried extract prepared as a tea or infusion in 8 oz of water
- Adult tincture: 2.5-5 ml of a 1:5 dilution in 45% alcohol added to a small amount of liquid
- Adult topical: use tincture as a mouthwash or paint on mucous membranes

Contraindications

Black catechu should not be used in children or those who are pregnant, breastfeeding, or have immunosuppressive conditions. Do not use for long-term treatment because of high tannin content.

Side Effects/Adverse Reactions

CV: Hypotension
ENDO: Hypoglycemia
GI: Constipation

Interactions

Drug

Anticholinergics: Black catechu may increase constipation when used with anticholinergics.
Antidiabetics: Black catechu may increase hypoglycemia (theoretical).
Antihypertensives: Black catechu may increase hypotension when used with antihypertensives.
Iron salts, zinc: Black catechu combined with iron salts, zinc form an insoluble complex; do not use together.

Lab Test

Hemoglobulin: Black catechu may decrease hemoglobulin.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Flavonoids	Catechu-red Galactopyranosyl	Decreases gastrointestinal inflammation
Catechins	Catechin Epicatechin (Shen, 2006)	
Acacatechin		
Quercetin		
Gum		

Client Considerations

Assess

- Assess the reason the client is using black catechu.
- Assess gastrointestinal system if using for gastrointestinal symptoms: diarrhea, constipation, abdominal pain, flatulence.
- Assess cardiac status in cardiac clients: heart rate, blood pressure; hypotension may occur.
- Monitor blood glucose in diabetic clients; hypoglycemia may occur.

Administer

- PO: Use dried extract, tea, infusion, or tincture

Teach Client/Family

- Advise the client not to use black catechu in children or those who are pregnant or breastfeeding until more research is available.
- Inform the client that constipation may occur.

Black Cohosh

(blak koe'hahsh)

Scientific names: *Actaea racemosa, Cimicifuga racemosa*

Other common names: Black snakeroot, bugbane, bugwort, cimicifuga, rattleroot, rattleweed, squaw root

Origin: Black cohosh is a perennial that grows in the eastern region of the United States and in parts of Canada.

Uses

Black cohosh is used as a smooth-muscle relaxant, an antispasmodic, an antitussive, an astringent, a diuretic, an antidiarrheal, an antiarthritic, and a hormone balancer in perimenopausal women. It is also used to decrease uterine spasms in the first trimester of pregnancy, as an antiabortion agent, and as a treatment for dysmenorrhea.

Investigational Uses

Investigation is ongoing into the use of black cohosh to treat menopausal symptoms.

Actions

Black cohosh has been researched extensively in the past few years, primarily for its effects when used to treat menopausal symptoms. The triterpene glycosides may be responsible for black cohosh's antiinflammatory and hormonal effects.

Estrogenic Action

In a very large study involving more than 100 physicians and more than 600 female patients, cimicifuga extract was given. Within 6 to 8 weeks, both physical and psychologic menopausal symptoms improved significantly. Most improved within 4 weeks (Stolze, 1982). Another double-blind study included 60 female patients who received cimicifuga extract, conjugated estrogens, or diazepam for 12 weeks. Patients using cimicifuga extract showed a significant improvement compared with patients using the two drugs (Warnecke, 1985). In a third study (also double blind), 80 female patients received cimicifuga extract, conjugated estrogens, or a placebo for 12 weeks. Those taking cimicifuga showed better results on the Kupperman Menopausal Index than the other patients (Stoll, 1987). These studies and others provide adequate evidence to support the use of black cohosh as an alternative to estrogen therapy in menopausal women. Unlike estrogens, black cohosh does not affect the secretion of prolactin, follicle-stimulating hormone, luteinizing hormone (Freudenstein et al, 2002). Another study (Zierau et al, 2002) identified contradictory results from previous studies. In this study antiestrogen results occurred when estradiol activities were antagonized. LH levels may be altered.

Black cohosh was studied for safety and efficacy in breast/prostate cancer patients (Walji et al, 2007). A critical assessment of clinical and preclinical studies of black cohosh and cancer (breast, prostate) was presented. It appears that black cohosh is safe in breast cancer without risk for liver disease.

Bone Resorption Action

No long-term studies have provided information on the role of black cohosh in the prevention of osteoporosis. However, epidemiologic studies have shown that black cohosh prevents osteoporosis in postmenopausal women.

Product Availability

Caplets: 40, 400, 420 mg; capsules: 25, 525 mg; fluid extract; powdered rhizome; solid (dry) powdered extract; tincture

Plant Parts Used: Rhizome (dried and fresh); roots

Dosages

- Adult PO caplets/capsules: 40-80 mg bid standardized to 1 mg triterpenes (27-deoxyactein) (20 mg) per caplet/capsule (total of 4-8 mg triterpene glycosides/day)
- Adult PO liquid extract: 0.9-6 ml/day (1:1) (Mills, Bone, 2005)
- Adult PO powdered rhizome: 1-2 g
- Adult PO solid dry powdered extract: 250-500 mg (4:1)
- Adult PO tincture: 6-12 ml/day (1:10) (Mills, Bone, 2005)
- Adult PO decoction 1.5-9 g daily

https://t.me/ALGRAWANY

Contraindications

Pregnancy category is 3; breastfeeding category is 4A.
Black cohosh should not be given to children except under the supervision of a qualified herbalist. Black cohosh should not be used in patients with a history of estrogen receptor–positive breast cancer, cholestasis, or celiac disease.

Side Effects/Adverse Reactions

CV: Hypotension, slow heart rate
ENDO: Uterine stimulation, miscarriage
GI: Nausea, vomiting, anorexia

Interactions

Drug

Antihypertensives: Black cohosh increases the action of antihypertensives; avoid concurrent use.
Docetaxel, doxorubicin: Black cohosh may increase the toxicity of docetaxel and doxorubicin; avoid concurrent use.
Hormonal contraceptives: Black cohosh may increase the effects; avoid concurrent use.
Hormone replacement therapy: Black cohosh may alter the effects of other hormone replacement therapies; use together cautiously.
Sedatives/hypnotics: Black cohosh may increase the hypotension; avoid concurrent use.
Tamoxifen: Black cohosh may augment the antiproliferative properties of tamoxifen (Freudenstein, 1999).

Lab Test

Luteinizing hormone (LH): Black cohosh may reduce LH and test results (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Acid	Caffeic acid; Fukinolic acid; Cimicifugic acids (A, B, E, F) Ferulic acid Isoferulic acid Salicylic acid	Inhibits neutrophil elastase Antiinflammatory
Triterpene glycoside	Actein; 27-Deoxyactein; Cimicifugoside; Cimicifugoside (B, M)	
Actacaepoxide Cycloartane glycoside		

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Flavonoid	Formononetin	May affect hormones (LH, FSH, prolactin, estradiol)
Caffeic acid derivative	Isoferulic acid	
Tannins		
Saponins		

Client Considerations

Assess

- Assess for menopausal and menstrual irregularities: length of cycle, amount of flow, spotting, pain, and hot flashes.
- Assess for the presence of ovarian cysts or fibroids.
- Assess for the use of other hormonal products: estrogen, progesterone, contraceptives, thyroid products, steroids, and androgens. Concurrent use requires caution (see Interactions).
- Assess for breast cancer or other cancers; avoid concurrent use.

Administer

- Instruct the client to take black cohosh PO using standardized products.
- Advise the client that effects are usually not seen until black cohosh is taken for at least 4 weeks.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 4A.
- Caution the client not to give black cohosh to children.

Black Haw

(blak haw)

Scientific names: *Viburnum prunifolium; Viburnum opulus*

Other common names: American sloe, cramp bark, guelder-rose, may rose, nannyberry, sheepberry, shonny, silver bells, sloe, stagbush, sweet haw, sweet viburnum

Origin: Black haw is found in the eastern region of the United States.

Uses

Black haw is used as a diuretic; an antispasmodic; a sedative; for headaches, arthritis, fever, and other pains; a uterine relaxant; and to treat dysmenorrhea, asthma, and cardiovascular conditions such as hypertension.

Actions

Black haw is a bronchospasmolytic, antiasthmatic, hypotensive, and astringent (Mills, Bone, 2005). The only major action of black haw that has been studied is its ability to reduce uterine excitability in laboratory animals (Reynolds, 1996).

One of the coumarins, scopoletin, may be responsible for the antispasmatic and uterine relaxant effect. However, preliminary studies have shown cardiovascular activity of the iridoid glucosides of *Viburnum prunifolium* (Cometa et al, 1998). One other study showed a digitalis-like activity on frogs and guinea pigs (Vlad et al, 1977).

Product Availability

Capsules, extract, tablets

Plant Parts Used: Bark of the roots, stem, or trunk

Dosages

- Adult PO decoction: may be taken tid; may also be used with other herbs (peppermint, chamomile, cramp bark, false unicorn root)
- Adult dried bark, infusion decoction: 7.5-15 g/day
- Adult liquid extract: 12-24 ml/day (1:1) or 1.5-4.5 ml/day (1:2)
- Adult tincture 15-30 ml/day (1:5) (Mills, Bone, 2005)

Contraindications

Pregnancy category is 3; breastfeeding category is 2A.
Persons with kidney stones should use this herb cautiously.

Side Effects/Adverse Reactions

GI: Gastrointestinal upset, irritation; nausea, vomiting (large doses)

Interactions

Drug

***Anticoagulants** (aspirin, heparin, warfarin):* Black haw may increase the action of anticoagulants; do not use concurrently.

Food

Calcium, iron, zinc: Black haw may decrease the absorption of calcium, iron, zinc from foods (Jellin et al, 2008).

Lab Test

INR, platelet count, AST, ALT, alkaline phosphatase: Black haw may increase these levels.

Primary Chemical Components and Possible Actions

Chemical Component	Individual Component	Possible Action
Coumarin	Scopoletin Scoplin; aesculetin	Antispasmodic; uterine relaxant
Phenol acid	Salicin; Salicylic acids	
Flavonoid	Amentoflavon	
Oxalate		
Volatile oil		
Tannin		
Resin		

= Pregnancy = Pediatric = Alert = Popular Herb

Primary Chemical Components and Possible Actions—cont'd

Chemical Component	Individual Component	Possible Action
Triterpenoids	Virgatic acid; Vibsanin B; 3-Hydroxyvibsanin E; Oleanadien (Fukuyama, 2002)	

Client Considerations

Assess

- Assess for allergic reactions such as rash, chest tightness, and trouble breathing. If present, administer antihistamine or other appropriate therapy.
- Assess for bleeding; check for the use of aspirin, NSAIDs, and anticoagulants (see Interactions).
- Assess for menstrual discomfort and relief after using this herb.

Administer

- Instruct the client to take black haw as an infusion or tea.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 2A.
- Teach the client that black haw may be given to children as an antispasmodic.

Black Hellebore ◆

(blak heh-luh-bowr)

Scientific name: *Helleborus niger*

Other common names: Christe herbe, Christmas rose, Easter rose, melampode

Origin: Black hellebore is a perennial ornamental plant.

Uses

Black hellebore traditionally has been used as an anthelmintic, antianxiety agent, and antipsychotic; as a treatment for restlessness; and for its laxative effect. It has also been used to induce abortion and to treat pregnancy-induced hypertension, amenorrhea, and central nervous system conditions such as seizure disorders, meningitis, and encephalitis.

Investigational Uses

Investigation is ongoing into the use of black hellebore as an immunostimulant for cancer patients.

Actions

◆ Black hellebore is considered poisonous. Most herbal practitioners do not use it because of the potential for toxic reactions. The only identified therapeutic actions of black hellebore are its possible antifungal and antineoplastic properties. When compared with the action of cyclophosphamide, the action of black hellebore is weak (Büssing et al, 1998). Very little research has been done on this herb because it is so toxic.

Product Availability

Fluid extract, powdered root, solid extract

Plant Parts Used: Rhizome (dried), root

Dosages

Laxative

- Adult PO fluid extract: 1-10 drops prn
- Adult PO powder: 10-20 grains prn
- Adult PO solid extract: 1-2 grains prn

Contraindications

Because it can cause abortion, black hellebore should not be used during pregnancy. Until more research is available, this herb should not be used during breastfeeding and should not be given to children. Persons with hypersensitivity to black hellebore should not use this herb. This plant is considered poisonous; therefore its use is discouraged.

Side Effects/Adverse Reactions

CNS: Dizziness, paresthesia, *seizures*
CV: Hypertension, hypotension, *bradycardia, arrhythmias*
GI: Nausea, vomiting, anorexia, diarrhea, abdominal cramps, burning in throat
INTEG: *Hypersensitivity reactions,* dermatitis
RESP: Shortness of breath, *respiratory failure related to contamination of the herb*
Toxicity: *Nausea, vomiting, diarrhea, abdominal pain, change in vision, burning throat, coma, paralysis*

Interactions

Drug

Cardiac glycosides *(digoxin):* Black hellebore contains cardiac glycosides; use with digoxin or other cardiac glycosides can lead to additive effect; avoid concurrent use.
Diuretics: Black hellebore with a diuretic can lead to toxicity; avoid concurrent use.
Macrolide antibiotics *(azithromycin, clarithromycin, erythromycin):* Black hellebore used with a macrolide can lead to cardiac toxicity; avoid concurrent use (Jellin et al, 2008).

Herb

Buckthorn, cascara: Hypokalemia can result from the use of buckthorn or cascara with *Helleborus* spp.; avoid concurrent use.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Components	Possible Action
Agylcone	Hellebrin	
Glycosides	Helleborin; Helleborcin; Bufadienole	Toxicity
Saponosides		
Resin		
Ranunculosides		

= Pregnancy = Pediatric = Alert = Popular Herb

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue use of this herb and administer antihistamine or other appropriate therapy.
- Assess for use of cardiac glycosides, diuretics, macrolides; avoid use with black hellebore.
- Determine the reason the client is using black hellebore and suggest safer, more conventional alternatives. This herb is rarely used because its toxic and therapeutic levels are so close.

Administer

- Instruct the client to store black hellebore in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Because it can cause abortion, caution the client not to use black hellebore during pregnancy. Until more research is available, caution the client not to use this herb during breastfeeding and not to give it to children.
- Advise the client that this plant is considered poisonous and should not be used. Black hellebore is commonly contaminated with other *Helleborus* spp., which yields a more poisonous plant.

Black Pepper

(blak peh′pur)

Scientific name: *Piper nigrum*

Other common names: Biber, filfil, hu-chiao, kosho, krishnadi, lada, pepe, peper, pfeffer, phi noi, pimenta, pjerets, poivre, the king of spices, the master spice

Origin: Black pepper is found in the Spice Islands.

Uses

Black pepper traditionally has been used internally to treat gastrointestinal symptoms such as flatus, anorexia, indigestion, heartburn, peptic ulcers, abdominal pain, cramps, colic, diarrhea, and constipation. It has also been used to treat joint and respiratory disorders and to stimulate mental processes. Black pepper is used externally to treat neuralgia and scabies.

Actions

Black pepper has been researched for its melanocyte proliferation and antibacterial, antiandrogenic, antioxidant, and chemoprotective/carcinogenic actions. One of the alkaloids, piperine, may be responsible for black pepper's antiandrogenic, antiinflammatory, and hepatoprotective properties. The amide feruperine is an antioxidant.

Melanocyte Proliferation

A study undertaken to identify repigmenting agents (Lin et al, 1999) identified the ability of black pepper to promote melanocyte proliferation. Black pepper was found to stimulate melanocyte growth. This was also true of piperine, one of the alkaloids of black pepper.

Antibacterial and Antioxidant Actions

Two studies identified the antibacterial properties of black pepper (Dorman et al, 2000, Reddy, 2004). One study focused on several herbs possessing powerful antibacterial effects. The other study demonstrated the antibacterial effect of black pepper against *Staphylococcus aureus* growth. *Piper nigrum* was also found to act as an antioxidant when it was studied to determine its potential application in food preservation (Nakatani et al, 1986).

Chemoprotective/Carcinogenic Action

Several studies have focused on the carcinogenic properties of black pepper. Most of these studies used laboratory animals that were force-fed black pepper in large amounts. These laboratory animals developed various tumors, depending on the study (El-Mofty et al, 1988, 1991; Shwaireb et al, 1990). Other studies have shown a chemoprotective effect in the colon. This effect may be due to the reduction of toxins (Nalini et al, 1998).

Product Availability

Powder

Plant Part Used: Fruit

Dosages

- Adult PO: 300-600 mg/day, max 1.5 g/day (Jellin et al, 2008).

Contraindications

Class 1 herb (fruit).

Until more research is available, black pepper (medicinally) should not be used therapeutically during pregnancy and breastfeeding, and should not be given therapeutically to children. Black pepper should not be used therapeutically by persons with hypersensitivity to this herb.

Side Effects/Adverse Reactions

EENT: Eye irritation, swelling (topical eye contact)
INTEG: Hypersensitivity reactions
MISC: Weak carcinogenic action
RESP: *Apnea (large amounts in children)*

Interactions

Drug

Cytochrome P450: Concurrent use of black pepper with drugs metabolized by cytochrome P450 should be avoided.
Phenytoin: Black pepper with dilantin speeds absorption and slows elimination of phenytoin (Jellin et al, 2008).
Propranolol: Black pepper speeds absorption and increases effect of propranolol (Jellin et al, 2008).
Theophylline: Black pepper increases absorption of theophylline (Jellin et al, 2008).

Lab Test

Phenytoin, propranolol, theophylline, serum drug assays: Black pepper can increase phenytoin, propranolol, theophylline concentrations, and serum drug assays (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid	Piperine	Melanocyte proliferation; hepatoprotective; antiinflammatory; antiandrogenic (Hirata, 2007)
	Piperyline; Piperlongumine; Piperidine; Piperettine; Piperanine; Chavicin	
Essential oil	Sabinene; Carvone; Myrcene; Limonene; Borneol; Carvacrol; Linalool; Alpha-pinene; Beta-pinene; Humelene; Bisabolone; Caryophyllene	Aromatic
Safrole		Weak carcinogen
Eugenol		
Myristicin		
Tannic acid		Weak carcinogen
Amide	Feruperine	Antioxidant

Client Considerations

Assess

- Assess for hypersensitivity reactions. If these are present, discontinue use of black pepper and administer antihistamine or other appropriate therapy.
- Assess for the use of phenytoin, propranolol, theophylline, and drugs metabolized by cytochrome P450 (see Interactions).

Administer

- Instruct the client to store black pepper in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Advise the client not to use black pepper therapeutically in children or those who are pregnant or breastfeeding until more research is available.

Black Root

(blak rewt)

Scientific names: *Veronicastrum virginicum, Leptandra virginica, Veronica virginica*

Other common names: Bowman root, brinton root, Culver's physic, Culver's root, high veronica, hini, leptandra, physic root, quitel, tall speed-well, Veronica

Origin: Black root is found in the United States and Canada.

Uses

Black root is used as an emetic, a diuretic, a laxative, and an astringent, as well as to relieve jaundice. This herb is rarely used today.

Actions

Very little primary research is available for black root. In traditional herbal medicine, black root has been used for the astringent properties of its tannic acid component and the diuretic effect of D-mannitol/mannite.

Product Availability

Root (dried and fresh), tincture

Plant Parts Used: Rhizome, roots

Dosages

- Adult PO tea: 1-2 tsp dried root, mixed in cold water, then boiled and steeped for 15 min
- Adult PO tincture: 1-2 ml tid

Contraindications

Class 1 herb (dried root); class 2b/2d herb (fresh root).
Black root should not be used during pregnancy (abortifacient) and breast-feeding, and should not be given to children.

Side Effects/Adverse Reactions

CNS: Headache, drowsiness
GI: Nausea, vomiting, anorexia, abdominal cramps, stool color change, *hepatotoxicity (large amounts of dried leaves)*

Interactions

Drug

Atropine: Black root forms an insoluble complex with atropine, which reduces the atropine effect; do not use concurrently.
Cardiac glycosides (digoxin), scopolamine: Black root forms an insoluble complex with cardiac glycosides, scopolamine; do not use concurrently.
Diuretics: Black root may increase hypokalemia in those receiving diuretics; avoid concurrent use or added potassium; supplementation may be needed (Jellin et al, 2008).
Hepatotoxic agents: Avoid the concurrent use of black root with any hepatotoxic agents.

Herb

Potassium-depleting herbs (horsetail, licorice): Black root may cause increased potassium depletion when given with horsetail, licorice (theoretical).

Lab Test

AST, ALT, alkaline phosphatase: Black root may increase these tests.
Potassium: Black root may decrease potassium level.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil	Verosterol	
Tannic acid		Astringent; wound healing; antisecretory
Leptandrin		
Acid	Cinnamic acid; Parameth-oxycinnamic acid	
Resin		
Gum		
Mannite		Diuretic
D-Mannitol		

Client Considerations

Assess

- Assess hepatic function test results (AST, ALT); monitor for hepatotoxicity, including jaundice, fever, and increases in hepatic function levels. If increased levels are present, discontinue use of this herb.

Administer

- Caution the client to avoid the consumption of dried leaves; hepatotoxicity can occur.

Teach Client/Family

- Caution the client not to use black root in children or those who are pregnant or breastfeeding until more research is available.

Blessed Thistle

(bleh'suhd thi'sul)

Scientific names: *Carbenia benedicta, Cnicus benedictus, Carduus benedictus*

Other common names: Cardo santo, chardon benit, holy thistle, kardobene-diktenkraut, spotted thistle, St. Benedict thistle

Origin: Blessed thistle is an annual found in Europe and Asia.

Uses

Blessed thistle is used for gastrointestinal discomfort; hepatic disorders such as jaundice, hepatitis, myrroghia, and dyspepsia; to improve digestion and memory; to stimulate lactation; to treat anorexia; and as a bacteriocidal.

Actions

Blessed thistle has primarily been used to stimulate the appetite and increase gastric secretion. The sesquiterpene lactone cnicin may be responsible for the appetite stimulant and antibacterial properties. However, some reports indicate that this herb may possess antiinfective properties.

Product Availability

Capsules, dried herb, tea, tincture

Plant Parts Used: Dried leaves, upper stems, seeds

Dosages

- Adult PO: 4-6 g herb daily (Blumenthal, 1998)

Contraindications

Class 2b herb.

Blessed thistle should not be used during pregnancy and should not be given to children. It should not be used by persons with hypersensitivity to this herb.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia
INTEG: Contact dermatitis
SYST: Hypersensitivity

Interactions

Drug

H_2-blockers, proton pump inhibitors: Blessed thistle may decrease the action of H_2-blockers and proton pump inhibitors (theoretical) (Jellin et al, 2008).

Herb

Asteraceae species *(arnica, boneset, burdock, bullerbur, carlile thistle, chamomile, chicory, colts' foot daisy, dandelion, echinacea, elecampane, feverfew, goldenrod, lutein, marigold, milk thistle, mugwort, ragwort, safflower, santonica, saw palmetto, southern wood, stevia, tansy, wild lettuce, wormwood, yarrow):* Blessed thistle may cause cross sensitivity.

Lab Test

AST, ALT, alkaline phosphatase: Blessed thistle may increase these levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Sesquiterpene lactone	Cnicin; Salonitenolide	Weak cytotoxic; appetite stimulant; antibacterial
Tannins		

Client Considerations

Assess

- Assess for allergic reactions and contact dermatitis; if these are present, discontinue use of this herb.

Administer

- Instruct the client to store blessed thistle in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use blessed thistle in children or those who are pregnant or breastfeeding until more research is available.
- Inform the client that research on this herb is lacking.

Bloodroot

(bluhd'rewt)

Scientific name: *Sanguinaria canadensis* L.

Other common names: Coon root, Indian paint, paucon, pauson, red puccoon, redroot, sweet slumber, tetterwort

Origin: Bloodroot is a perennial found in Canada and the southern region of the United States.

Uses

Bloodroot has been used for its expectorant, antimicrobial, antiinflammatory, antiplaque (dental—topically), and antifungal properties. It has also been used topically for the treatment of skin, ear, and nose cancer and for nasal polyps.

Actions

The use of bloodroot is considered to be obsolete because of its toxicity. However, its various actions account for its continued use. The isoquinolone alkaloids sanguinarine and chelerythrine possess antimicrobial and antimycobacterial actions. Sanguinarine is a hypotensive dental antiplaque and CNS depressant.

Analgesic Action

The analgesic action of bloodroot occurs via mechanisms similar to those of opioids, with paralysis of the nerve endings leading to lessened pain.

Antiplaque Action

The antiplaque action of bloodroot is well documented in the literature. Some toothpaste and mouthwash manufacturers include bloodroot as an ingredient to help limit oral plaque. The alkaloid sanguinarine is effective against various oral bacteria (Dzink et al, 1985; Godowski, 1989). This action appears to be due to an alkaloid present in the herb.

Topical Action

Bloodroot has been found to corrode and destroy topical cancers and topical fungal infections (Phelan et al, 1963). In cancers of the nose and ears, bloodroot has been shown to destroy these lesions.

Other Actions

Methanol extracts of the rhizomes of bloodroot were analyzed. Two isoquinoline alkaloids were identified in the active fraction. Sanguinarine and chelerythrine inhibited the growth of bacterium (Mahady, 2003).

Product Availability

Extract, tincture

Plant Part Used: Rhizome

Dosages

- Adult PO extract: 0.06-0.3 ml tid (1:1 in 60% alcohol)
- Adult PO tincture: 0.3-2 ml tid
- Adult PO rhizome: 60-500 mg tid (Jellin et al, 2008)

Contraindications

Class 2b/2d herb.

Bloodroot should not be used during pregnancy and breastfeeding, and it should not be given to children. Bloodroot should not be used to treat deep wounds. The FDA classifies this herb as unsafe; therefore this herb should be used only under the supervision of a qualified herbalist. Handling the fresh root without gloves can cause skin irritation.

Side Effects/Adverse Reactions

CNS: Headache, *central nervous system depression, loss of consciousness*
CV: *Hypotension, shock, coma (excessive doses)*
EENT: Glaucoma (high-doses)
GI: Nausea, vomiting, anorexia
INTEG: Contact dermatitis (topical)

Interactions

Drug

Antihypertensives, ganglionic/peripheral adrenergic blockers: Bloodroot may increase the effects of these products.
CNS depressants: Bloodroot may increase the sedative effect of CNS depressants.
Corticosteroids: Bloodroot may increase potassium loss.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Isoquinolone alkaloid	Sanguinarine	Hypotensive, dental antiplaque, central nervous system depressant, antimicrobial, antimycobacterial
	Homochelidonine; Sanguidimerine; Chelirubine; Sanguilutine; Allocryptopine	
	Chelerythrine	Antimycobacterial (Newton et al, 2002)
	Protopine; Oxysanguinarine; Berberine; Coptisine	
Resin		

Client Considerations

Assess

- Assess the client's cardiovascular status (blood pressure; pulse, including character) and level of consciousness. Hypotension, shock, and coma may occur with increased doses.
- Determine the quantity of the herb ingested.

Administer

- Caution the client to take only carefully calculated doses of bloodroot. Higher doses can lead to coma.
- Caution the client to not take orally the juice or powdered rhizome of bloodroot; may cause toxicity.

Teach Client/Family

- Caution the client not to use bloodroot in children or those who are pregnant or breastfeeding until more research is available.
- Caution the client to use bloodroot only under the direction of a competent herbalist. Bloodroot is considered unsafe by the FDA.

Blue Cohosh

(blew koe'hahsh)

Scientific name: *Caulophyllum thalictroides*

Other common names: Blue ginseng, papoose root, squaw root, yellow ginseng

Origin: Blue cohosh is a perennial found in the midwestern and eastern regions of the United States.

Uses

Blue cohosh is used to induce labor, to treat rheumatism, to increase menstrual flow, and as an anticonvulsant, antispasmodic, and abortifacient (Rao, 2002).

Actions

Blue cohosh can cause perinatal stroke, profound CHF and shock, acute MI, and severe multiorgan hypoxic injury (Dugoua, 2008). The saponin caulosaponin and magnoflorine are uterine stimulants. The alkaloid methylcystine is a CNS stimulant and also acts as nicotine would.

Embryotoxic Action

Blue cohosh is known to contain embryotoxic alkaloids (Jones et al, 1998). Both blue and black cohosh have been used for centuries to stimulate uterine contractions. However, studies have only recently confirmed the embryotoxic nature of blue cohosh. Two studies have shown significant embryotoxicity when a mother ingested blue cohosh to stimulate uterine contractions. In one case, the infant was born with acute myocardial infarction associated with congestive heart failure and shock (Jones et al, 1998).

Uterine Stimulant Action

Four of the alkaloids present in blue cohosh—baptifoline, anagyrine, ubiquitous, and magnoflorine—were tested to determine their uterine stimulant actions. Research revealed that the four are effective only when present together. When tested individually, each exhibited marginal uterotonic activity but showed no uterine stimulant activity. Saponins of the root and rhizome exert a definite oxytocic action, increasing the tone and rate of contractions (Brinker, 1995).

Product Availability

Capsules: 500 mg; dried root; powder; tablets; tea; tincture

Plant Parts Used: Aerial parts, rhizome, roots

Dosages

Likely unsafe for oral use (Jellin et al, 2008)
- Adult PO dried root/rhizome: 0.3-1 g tid
- Adult PO extract: 0.5-1 ml tid (1:1 in 70% alcohol)

Contraindications

Pregnancy category is 6; breastfeeding category is 5A.
Blue cohosh should not be given to children because the seeds are poisonous to them. Persons with cardiac disease, celiac disease, malabsorption, and vitamin A, D, E, K deficiency should not use blue cohosh. This product should only be used by a qualified herbalist and not the general public.

Side Effects/Adverse Reactions

CV: Chest pain, hypertension, *CHF, stroke, acute MI*
ENDO: Hyperglycemia
GI: Gastrointestinal irritation, cramps, diarrhea, mucous membrane irritation
Reproductive: *Embryotoxic,* inductive of labor
SYST: Nicotinic toxicity (Rao et al, 2002)

Interactions

Drug

Antianginals, antidiabetics: Blue cohosh may decrease the action of antianginals, causing chest pain, and antidiabetics; avoid concurrent use.
Antihistamines, barbiturates, methylphenidate, phenothiazines: Blue cohosh's metabolism may be decreased.
Antihypertensives, peripheral adrenergic blockers: When used with antihypertensives, peripheral adrenergic blockers, blue cohosh will decrease their action; avoid concurrent use.
Corticosteroids, hormonal contraceptives, tetracyclines: Blue cohosh may increase metabolism and decrease the effect of these products.
Nicotine: Blue cohosh will increase the effects of nicotine and may cause toxicity; avoid concurrent use.

Lab Test

Blood glucose: Blue cohosh may increase blood glucose level.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid	Methylcystine	Central nervous system stimulant; nicotinic toxicity (Rao et al, 2002)
	Taspine	Embryotoxicity

= Pregnancy = Pediatric = Alert = Popular Herb

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
	Magnoflorine; Anagyrine; Baptifoline; Ubiquitous	Uterine stimulant
	Thalictroidine; Lupanine; Sparteine	
Saponin	Caulosaponin; Cauloside	Uterine stimulant (Satchithanandam, 2008)
Phosphoric acid		
Phytosterol		

Client Considerations

Assess

- Assess cardiac status (blood pressure; pulse, including character, rate, and rhythm). Assess for the use of all medications (see Interactions).
- Assess diabetic clients for hypoglycemia; check glucose levels.
- Assess for toxicity; look for signs similar to those of nicotine poisoning (tachycardia, diaphoresis, abdominal pain, vomiting, muscle weakness, fasciculations).

Administer

- Ensure that commercial preparations are taken in the correct dosage.

Teach Client/Family

- Inform the client that pregnancy category is 6 and breastfeeding category is 5A.
- Caution the client to keep blue cohosh products out of the reach of children because the seeds are poisonous to them.
- Advise the client not to use nicotine products while using blue cohosh. The effects of nicotine will be increased.

Blue Flag

(blew flag)

Scientific name: *Iris versicolor*

Other common names: Dagger flower, dragon flower, flag lily, fleur-de-lis, flower-de-luce, liver lily, poison flag, snake lily, water flag, wild iris

Origin: Blue flag is a perennial found in the wetlands of the United States.

Uses

Blue flag is used primarily for its antimicrobial effects. It is also used for its laxative side effect and its emetic and diuretic properties. Blue flag is used topically to treat sores, bites, and bruises.

Actions

Most of the information available on the actions of blue flag is based on anecdotal evidence rather than primary research. The anecdotal evidence focuses on the

use of this herb as a laxative and an antiinflammatory. The tannins may be responsible for these actions. Irilon and irisolone may cause a laxative effect. Because of the toxicity of this herb, the unsupervised internal use of blue flag is not recommended.

Product Availability

Extract: 0.5-1 fluid drams (2.5-5 ml); powdered root: 20 grains (1300 mg); solid extract: 10-15 grains (650-975 mg); tincture: 1-3 fluid drams (5-15 ml)

Plant Parts Used: Rhizome with roots

Dosages

Laxative

- Adult PO powdered root: 10-20 grains one-time dose
- Adult PO tincture: ½-3 fluid drams one-time dose

Other

- Adult topical powdered root: make poultice, apply prn

Contraindications

Pregnancy category is 2; breastfeeding category is 2A.

Blue flag should not be given to children. It is contraindicated in all but small doses.

Side Effects/Adverse Reactions

CNS: Headache

EENT: Mucous membrane irritation, soreness

GI: Nausea, vomiting, anorexia, *hepatotoxicity*

SYST: *Death by poisoning*

Interactions

Drug

Anticoagulants, antiplatelets, salicylates: Blue flag may increase risk for bleeding.

Antihypertensives, ganglionic or peripheral adrenergics: Blue flag may increase the effect of these products.

Barbiturates, beta-blockers, sedative/hypnotics: Blue flag's effect may be decreased.

Cardiac glycosides *(digoxin):* Use with blue flag may lead to increased side effects (Jellin et al, 2008).

Diuretics: Use with blue flag may lead to hypokalemia (Jellin et al, 2008).

Herb

Aloe, buckthorn, cascara, castor, horsetail, licorice, podophyllium, senna, yellow dock: Use with blue flag may lead to hypokalemia.

Lab Test

Blood glucose, INR, PT: Blue flag may increase blood glucose, INR, PT levels.

Potassium: Blue flag may decrease potassium levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil	Furfural	
Triterpene	Irigermanal	
Glycoside	Irilon; Irisolone	Laxative
Xanthone	Irigenin; Tectoridine	
Flavonoid		
Starch		
Tannin		Wound healing; antiinflammatory
Gum		

Client Considerations

Assess

- Assess for severe nausea and vomiting.
- Assess for irritation or soreness of the mucous membranes.
- Assess for toxicity.

Administer

- Instruct the client to take blue flag PO to treat constipation. Dosages for other uses are not documented.

Teach Client/Family

- Inform the client that pregnancy category is 2 and breastfeeding category is 2A.
- Caution the client not to give blue flag to children.
- Advise the client not to use blue flag internally except under the direction of a competent herbalist and not to use it topically near mucous membranes.

Bogbean

(bahg′been)

Scientific name: *Menyanthes trifoliata*

Other common names: Buckbean, marsh trefoil, water shamrock

Origin: Bogbean is found in the wetlands of the United States and Europe.

Uses

Bogbean is used as an antiinflammatory, and to treat anorexia and gastrointestinal distress.

Actions

Very limited primary research exists on bogbean. One study researched its analgesic effect, postulating that bogbean decreases prostaglandin synthesis (Huang et al, 1995). Two chemical components of bogbean, caffeic acid and ferulic acid, have been identified as bile stimulants. Antiinfective properties have also been identified

(Bishop et al, 1951). In addition, anecdotal information suggests that bogbean stimulates the appetite and gastric juices. Immunomodulating polysaccharide fractions were identified in bogbean (Kudik-Jaworska, 2004).

Product Availability

Dried leaf, fluid extract, tincture

Plant Part Used: Leaves

Dosages

- Adult PO dried leaf: 1.5-3 g (Blumenthal, 1998) prepared as tea, used as often as tid
- Adult PO fluid extract: 1-2 ml (1:1 dilution) tid with 8 oz water

Contraindications

Class 2d herb.

Because uterine stimulation can occur, bogbean should not be used during pregnancy. Until more research is available, this herb should not be used during breastfeeding. Bogbean should not be given to children.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia

SYST: *Bleeding, hemolysis (if taken with anticoagulants, NSAIDs, antiplatelets)*

Interactions

Drug

Antacids, H_2 antagonists, proton pump inhibitors: Bogbean decreases the effect of these products.

Anticoagulants, antiplatelets, aspirin, NSAIDs: Use of bogbean with anticoagulants, antiplatelets, aspirin, and NSAIDs may increase the risk of bleeding; do not use concurrently.

Laxatives, stimulants: Bogbean may increase the effect of these products.

Herb

Angelica, anise, arnica, boldo, capsicum, celery, chamomile, clove, danshen, fenugreek, feverfew, garlic, ginger, ginkgo, horse chestnut, horseradish, licorice, meadowsweet, prickly ash, onion, papain, passionflower, poplar, red clover, turmeric, wild carrot, willow: Use with bogbean may increase risk for bleeding (Jellin et al, 2008).

Lab Test

Hemoglobin: Bogbean may decrease hemoglobin levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Acid	Caffeic acid; Ferulic acid Chlorogenic acid; Salicylic acid; Vanillic acid; Folic acid; Palmitic acid	Bile stimulant

= Pregnancy = Pediatric = Alert = Popular Herb

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Alkaloid	Gentianin; Gentianidine; Choline	
Flavonoid	Quercetin	Antiinflammatory
	Rutin	Antioxidant;
	Hyperin; Kaempferol; Trifolioside	immunomodulating (Kudik-Jaworska, 2004)
Coumarin		
Scopoletin		
Iridoid		
Carotene		
Ceryl alcohol		

Client Considerations

Assess

- Assess for bleeding. Determine whether the client is also taking aspirin, NSAIDs, anticoagulants, or antiplatelets, all of which will increase the risk of bleeding.
- Assess for pain and inflammation. Determine whether the client is taking bogbean to treat these conditions.

Administer

- Instruct the client to store bogbean in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Because uterine stimulation can occur, caution the client not to use bogbean during pregnancy. Until more research is available, caution the client not to use bogbean during breastfeeding.
- Do not give bogbean to children.
- Advise the client to avoid using bogbean with other medications that can cause bleeding: aspirin, anticoagulants, antiplatelets, NSAIDs.

Boldo

(bole′doe)

Scientific names: *Boldea boldus, Peumus boldus*

Other common names: Boldea, boldine, boldo-do-Chile, boldus

Origin: Boldo is an evergreen found in Chile, Peru, and Morocco.

Uses

Boldo is used as a laxative, liver tonic, and sedative. It is also used to treat spastic conditions of the gastrointestinal tract, flatulence, gout, dysmenorrhea, colds, and weakness.

Investigational Uses

Research is ongoing into the use of boldo as a treatment for gallstones.

Actions

Although boldo has been used to treat various conditions in many parts of the world, its actions are not well researched. Boldo is thought to possess diuretic, anthelmintic, and hepatoprotective actions. The tannins are responsible for wound healing and antiinflammatory actions. However, very little primary research is available to confirm these actions.

Diuretic Action

Boldo has been shown to possess diuretic effects. In a study of dogs given boldo, urine excretion increased by 50% (Speisky et al, 1994).

Anthelmintic Action

One of the chemical components of boldo, the volatile oil, ascaridole, exhibits anthelmintic activity.

Other Actions

Boldo may exert antioxidant, hepatoprotective, and antiinflammatory activity. However, little research currently exists to confirm these possible actions. Boldo has shown uterine stimulant effects and teratogenic effects in rats (Almedia, 2000). Only one study (Lanhers et al, 1991) could be found to confirm these effects. This study used an in vitro technique in mice. Boldine, the main alkaloid, appears to possess a hepatoprotective action but does not possess antiinflammatory action.

Product Availability

Extract, tea, tincture

Plant Part Used: Leaves

Dosages

Do not exceed recommended dosage.

- Adult PO: 0.2-3 g dried leaves daily
- Adult PO: 60-200 mg of dried leaf tid or as a tea tid (Jellin et al, 2008)
- Adult tincture: 1.5-6 ml/day (1:5); 1.8-6 ml/day (1:10) (Mills, Bone, 2005)
- Adult liquid extract: 0.7-2 ml/day (1:2) (Mills, Bone, 2005)

Contraindications

Pregnancy category is 7; breastfeeding category is 5A.

Boldo should not be given to children. Persons with neurologic or respiratory disease, renal disease, obstruction of the bile duct, or severe hepatic disease should avoid the use of boldo. Persons with gallstones should use this herb cautiously.

Side Effects/Adverse Reactions

Very high doses

CNS: *Paralysis, exaggerated reflexes, convulsions, coma, death*

RESP: *Respiratory depression*

Interactions

Drug

Anticoagulants, antiplatelets: Boldo given with anticoagulants, antiplatelets can lead to increased risk of bleeding (Jellin et al, 2008).

CNS depressants: Boldo may increase the effect of these products.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Isoquinolone alkaloid	Boldine; Isoboldine; Reticuline	Antispasmodic; diuretic; antiinflammatory; antipyretic; antioxidant
Flavonoid		
Volatile oil	Ascaridole; thymol; transverbenol	Anthelmintic
Coumarin		
Resin		
Tannin		Wound healing; antiinflammatory

Client Considerations

Assess

- Assess for central nervous system reactions and respiratory depression. If either is present, discontinue use of this herb.

Administer

- Instruct the client to store boldo in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 7 and breastfeeding category is 5A.
- Caution the client not to use boldo in children. Keep boldo products out of the reach of children because this herb is toxic in high doses.
- Advise the client to avoid the use of boldo if central nervous system disorder, respiratory disorder, or severe hepatic disease is present.

Boneset

(bown′seht)

Scientific name: *Eupatorium perfoliatum*

Other common names: Agueweed, crosswort, eupatorium, feverwort, Indian sage, Joe-pye-weed, sweating plant, thoroughwort, vegetable antimony

Origin: Boneset is a perennial found in the wetlands of the United States and Canada.

Uses

Boneset is used to treat fever, bronchitis, and influenza. It is also used as a sedative, a laxative, and an expectorant.

Investigational Uses

Beginning research has shown antiinflammatory, immunostimulant, and wound-healing properties of boneset. Also, it has the possibility of a weak antibacterial

action against gram-positive organisms, action against some parasitic infections, and a cytotoxic response.

Actions

The flavonoids may be responsible for wound healing and antiinflammatory properties. Pyrrolizidine alkaloids are hepatotoxic when used over a long period of time or in high doses. Several other chemical components of boneset have been identified, but the action is unknown.

Immunostimulant Action

One study demonstrated that the chemical components of boneset increase both granulocytes and macrophages (Wagner et al, 1985). Another study showed an increase in phagocytosis when boneset was combined with *Echinacea angustifolia, Baptisia tinctoria,* and *Arnica montana.* This increase in phagocytosis was much more pronounced when boneset was used in combination with the three other species than when it was used alone (Wagner et al, 1991).

Other Actions

Boneset has been shown to possess emetic, antiinflammatory, and antimalarial properties (Hall, 1974; Lira-Salazar, 2006). A study focused on the possible effects of boneset on the common cold and showed no changes in the cold as a result of the use of this herb (Gassinger et al, 1981). Habtemariam et al (2000) discovered a weak antibacterial effect (gram-positive organisms *[Staphylococcus aureus, Bacillus megaterium]*) and a potent cytotoxic effect when compared with chlorambucil.

Product Availability

Extract, tea

Plant Parts Used: Dried leaves, flowers, whole herb

Dosages

- Adult PO extract: 10-40 drops mixed in a small amount of liquid, tid
- Adult PO tea: 2-6 tsp dried leaves (crushed) or flowers in ≥8 oz water, boiled then steeped for 15 min, tid

Contraindications

Class 4 herb.

Because uterine stimulation can occur, boneset should not be used during pregnancy. Until more research is available, this herb should not be used during breastfeeding. Persons with hepatic disorders, an allergy to ragweed (Jellin et al, 2008), or a hypersensitivity to boneset should not use this herb. Avoid long-term use; toxicity can occur.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, diarrhea, *hepatotoxicity*
SYST: Hypersensitivity

Interactions

Herb

Asteracae family *(daisy, chrysthanemum):* Boneset can produce allergic reactions with these herbs.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alcohol	Tremetol	Antidiabetic
Volatile oil		
Triterpenes		
Flavonoid	Kaempferol; Quercetin; Astragalin; Rutin	Wound healing; antiinflammatory
Glycoside	Eupatorin	
Resin insulin sterols		
Pyrrolizidine alkaloids		Hepatotoxic

Client Considerations

Assess

- Assess for hepatotoxicity (jaundice, increased hepatic function test levels, clay-colored stools, right upper-quadrant pain). If these symptoms occur, use of this herb should be discontinued.
- Assess for gastrointestinal symptoms, nausea, vomiting, diarrhea; if these symptoms occur, use of herb should be discontinued.
- Assess for hypersensitivity reactions; if present, discontinue use of this herb.

Administer

- Instruct the client to take boneset PO as a tea or extract.
- Instruct the client to store boneset in a cool, dry place, away from heat and moisture.
- Inform the client that boneset may be given to children in small doses.

Teach Client/Family

- Because uterine stimulation can occur, caution the client not to use boneset during pregnancy. Until more research is available, advise the client not to use this herb during breastfeeding.

Borage

(baw′rij)

Scientific name: *Borage officinalis*

Other common names: Beebread, common borage, common bugloss, cool tankard, ox's tongue, starflower

Origin: Borage is an annual found in North America and Europe.

Uses

Borage is used to treat arthritis, hypertension, the common cold, and bronchitis. It has been used primarily as a galactagogue but should not be used during breastfeeding until research confirms or denies the presence of pyrrolizidine alkaloids. Borage is also used for menopause, depression, adrenal replenishment, and as a tonic.

Investigational Uses

Borage may decrease body fat accumulation.

Actions

Antiinflammatory Action

Several studies have demonstrated the beneficial effects of borage oil for treating rheumatoid conditions. Diets high in arachidonic acid have been shown to increase the formation of prostaglandin and leukotriene with proinflammatory action (Zurier et al, 1996). Two studies have shown that doses of 1.1 to 1.4 g gamma-linolenic acid in borage seed oil reduces joint inflammation significantly (Leventhal et al, 1993; Pullman-Mooar et al, 1990). A study using a combination of evening primrose oil and borage oil showed positive results in rheumatologic conditions (Belch et al, 2000). However, not all studies have shown positive results.

Antihypertensive Action

One study has shown that the high levels of gamma-linolenic acid in borage oil are responsible for its ability to decrease hypertension. The decrease in blood pressure occurred in response to two factors: (1) a reduction in the affinity to angiotensin II receptors in cells that produce aldosterone and (2) a reduction in the aldosterone/renin ratio (Engler et al, 1998).

Other Actions

A borage oil study has shown a decrease in body fat accumulation in rats. Rats were fed a low-fat diet containing borage oil. The result was a decrease in body fat mass (Takahashi et al, 2000). Rosmarinic acid may be responsible for the antioxidant action in borage (Bandoniene, 2002). Borage extract revealed in the lab the presence of several radial scavenging components.

Product Availability

Capsules: 240, 500, 1300 mg; seed oil

Plant Parts Used: Leaves, seeds, stems

Dosages

Joint Inflammation

- Adult PO seed oil: 1.1-1.4 g gamma-linolenic acid daily (Leventhal et al, 1993; Pullman-Mooar et al, 1990)

Contraindications

Class 2a/2b/2c herb.

Until more research is available, borage should not be used during pregnancy and breastfeeding because of the possible presence of pyrrolizidine alkaloids. It should not be given to children.

Side Effects/Adverse Reactions

GI: *Hepatotoxicity*

Interactions

Drug

Anticoagulants, antiplatelets, salicylates: Borage may increase the risk for bleeding.

Anticonvulsants: Bogbean may decrease the effect of this product.

Interactions—cont'd

Hepatotoxic drugs: Borage when given with hepatotoxic drugs, may lead to increased hepatotoxicity (Jellin et al, 2008).

Herb

Eucalyptus: Use with borage may increase unsaturated pyrrolizidine alkaloid (UPA) (Jellin et al, 2008).

Lab Test

AST, ALT, alkaline phosphatase, PT, INR: Borage may increase these levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alcohols	Hexanol, Cis-z-hexenol	
Aldehydes		
Mucilage		Expectorant
Acid	Malic acid	Diuretic
Tannin		Wound healing; antiinflammatory
Essential oil	Nonadecane, Tetrocosane, Hepatocosane	
Hydrocarbons		
Fatty acid	Gamma-linolenic, Linoleic, Alpha-linolenic, Stearidonic, Palmitic (Mhamdi, 2007)	Antiinflammatory; antihypertensive
Oleic	Saturated	
Alkaloid, pyrrolizidine	Amabiline Thesinine	Hepatotoxic
Rosmarinic acid		Antioxidant (Bandoniene, 2002)

Client Considerations

Assess

- Assess for hepatotoxicity (jaundice, increased liver function test levels, clay-colored stools, right upper-quadrant pain). If these occur, use of borage should be discontinued.
- If the client is using borage to treat joint conditions, assess for pain and inflammation (location, duration, intensity), including aggravating and alleviating factors.
- Assess blood pressure and pulse if borage is being used to treat hypertension.
- Assess body weight if using to decrease body fat accumulation.

Administer

- Instruct the client to use borage oil that contains 20% to 26% gamma-linolenic acid.

Teach Client/Family

- Caution the client not to use borage in children or those who are pregnant or breastfeeding until more research is available.
- Caution the client that one of the chemical components of borage, an alkaloid known as amabiline, can cause hepatotoxicity. Nettle, dandelion, and marshmallow root treat the same conditions as borage and are safer herbs; therefore they may be better choices.

Boron

(bor′on)

Scientific names: *Boron, B*

Other common names: Borate, boric acid, boric tartrate

Origin: Boron is a mineral found naturally.

Uses

Boron is used to increase bone density, for osteoarthritis. Boric acid is used topically as an astringent and as an irrigant for the eye.

Actions

Boron is an element found in nature. It may be responsible for the absorption of calcium, phosphorus, and magnesium from the diet. Boron has been shown to be helpful in the management of osteoarthritis, as supplementation may decrease pain during movement (Travers et al, 1990). When given with hormone replacement in women, boron showed reduced incidence of lung cancer. It may play a role in host defense against cancer due to inflammation (Mahabir, 2008).

Product Availability

Tablets, capsules, solution

Dosages

Do not use boric acid/borate orally because it can be fatal.

- Adult PO: 3-6 mg/day (Pizzorno, Murray, 2006).

Contraindications

Do not use boric acid/borate orally—it can be fatal.

Boron should not be used in children, or those who are pregnant, breastfeeding, hypersensitive, or have renal/hepatic disease.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, indigestion (large doses)

INTEG: Alopecia, dermatitis

SYST: *Acute poisoning: tremors, seizures, irritability, weakness, lethargy, headache, depression, exfoliation, rash*

Interactions

Drug

Estrogens: Boron may increase the effect of estrogens.

Interactions—cont'd

Lab Test

Magnesium, phosphorous: Boron may decrease the effect of magnesium, phosphorous.

Client Considerations

Assess

- Assess the reason the client is using boron medicinally.

Administer

- Keep boron in a dry area, away from direct sunlight.

Teach Client/Family

- Advise the client not to use boron in children or those who are pregnant or breast-feeding until more research is available.
- Advise the client of acute poisoning symptoms.
- Instruct the client to not use boric acid/borate orally because it can be fatal.

Boswellia

(bahz'weh-lee-uh)

Scientific name: *Boswellia serrata*

Other common names: Indian frankincense, olibanum

Origin: Boswellia is a tree or shrub and is found in India, America, North Africa, and Arab countries.

Uses

Boswellia has been used traditionally for arthritis and other inflammatory conditions. It has been used commonly for syphilis, asthma, and cancer.

Actions

Antiinflammatory Action

Boswellia was studied in animals to determine the result on inflammatory disease. Boswellia decreases leukotriene synthesis that is responsible for maintaining inflammation and edema. Boswellia resin action in ulcerative colitis may be due to the inhibition of 5-lipoxygenase (Bruneton, 1995; Gupta et al, 1997; Ammon, 2003).

Product Availability

Caps, tabs, standardized fluid extract (60%-65% boswellic acids), cream, resin

Plant Part Used: Dried resin

Dosages

Inflammation

- Adult PO: cap/tabs 400 mg tid

Ulcerative colitis

- Adult PO: cap/tabs 350-400 mg tid for 6 weeks

Other Doses

- Adult PO: dried resin 2-9 g/day
- Adult PO: standardized extract: 600-1200 mg/day (60% boswellic acids) (Mills, Bone, 2005)

Contraindications

Pregnancy category is 2; breastfeeding category is 2A.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Boswellic acids	Beta-boswellic acid; Acetyl-beta boswellic acid; 11-keto-beta boswellic acid; Acetyl 11-keto beta boswellic acid	Nonredox inhibitors of leukotriene synthesis (Ammon, 2002)
Volatile oils		Respiratory support
Terpinoids		Wound healing
Arabinose		
Xylose		
Beta sitosterin		

Client Considerations

Assess

- Assess the reason the client is using boswellia medicinally.

Administer

- Do not administer large doses; lethal doses have been identified in rodents.

Teach Client/Family

- Inform the client that pregnancy category is 2 and breastfeeding category is 2A.
- Teach the client that boswellia may be used in children.

Brewer's Yeast

(brew'uhrz yeest)

Scientific name: *Saccharomyces cerevisiae*

Other common names: Medicinal yeast

Origin: Brewer's yeast originates from the beer brewing process.

Uses

Brewer's yeast has been used traditionally for irritable bowel syndrome, diarrhea, and gastritis and has been used topically for acne and contact dermatitis. It has also been used as a source of high-content vitamin B-complex and protein (Jellin et al, 2008).

Investigational Uses

Studies are underway to confirm the antiinfective and antidiabetic uses of brewer's yeast.

Actions

Antiinfective Action

One study (Izachia et al, 1998) identified that brewer's yeast is capable of preventing *Clostridium difficile*–associated diarrhea. The action may be due to the reduction of *C. difficile* toxin–mediated secretion. Another study (Li et al, 1998) identified the antiviral effect of polysaccharides in brewer's yeast. The viruses that were inhibited were poliovirus III, adenovirus III, ECHO6 virus, enterovirus 71, vesicular stomatitis virus, herpesviruses I and II, and coxsackie A16 and B3 viruses.

Antidiabetic Action

Two studies (Holdsworth et al, 1988; Li, 1994) identified the antidiabetic effects of brewer's yeast. Glucose values were lowered in both studies.

Product Availability

Tablets, powder, liquid

Plant Part Used: Yeast from beer brewing process

Dosage

Gastrointestinal symptoms

- Adult PO powder: 1-2 tsp tid

Contraindications

Brewer's yeast should not be used in persons with compromised immune systems or Crohn's disease. Those who have Crohn's disease are likely to have developed antibodies to the yeast.

Side Effects/Adverse Reactions

CNS: Severe headache (hypersensitive reactions)
ENDO: Decreased blood glucose (diabetic clients)
GI: Abdominal cramps, flatulence
SYST: Allergic reactions

Client Considerations

Assess

- Determine the reason the client is using brewer's yeast medicinally.
- Assess for severe, migraine-like headaches that may be due to a hypersensitive reaction. Brewer's yeast should be discontinued if this occurs.
- Assess diabetic client's blood glucose levels. Brewer's yeast may lower blood glucose.

Administer

- PO using powder.

Teach Client/Family

- Teach the client that brewer's yeast should not be used in immunocompromised individuals.

Broom

(brewm)

Scientific names: *Sarothamnus scoparius*

Other common names: Bannal, broom top, genista, ginsterkraut, hogweed, Irish broom top, sarothamni herb, Scotch broom, Scotch broom top. Do not confuse with Spanish broom or butcher's broom.

Origin: Broom is a deciduous plant found in Europe, and in the Pacific Northwest and eastern regions of the United States.

Uses

Broom is used as an antiarrhythmic, a diuretic, and an emetic or uterine contactant.

Actions

Antiarrhythmic Action

Sparteine, one of the alkaloid components of broom, has shown antiarrhythmic activity similar to that of antiarrhythmic IA. Sparteine decreases heart rate and is considered to be similar to quinidine (Bowman et al, 1980). It can also inhibit sodium and potassium transport across the cell membrane in cardiac cells (Pugsley et al, 1995) and is used in Germany to treat cardiac disorders.

Diuretic Action

Scoparoside, one of the flavone glycosides of broom, exerts a powerful diuretic effect at high doses.

Other Actions

Sparteine has been shown to cause strong uterine contractions and for this reason should not be used during pregnancy. In many countries, broom is used to stimulate labor. In addition, many of the lectins (a type of plant-derived hemagglutinin) have been used as pharmacologic probes (Young et al, 1984). One study has shown that the lectins are able to bind B- and T-lymphocytes (Malin-Berdel, 1984).

Product Availability

Cigarette, extract, root, tea

Plant Parts Used: Flowers, twigs

Dosages

Dosages are not clearly delineated in the literature.

Contraindications

Because it can cause spontaneous abortion, broom should not be used during pregnancy. Until more research is available, broom should not be used during breastfeeding and should not be given to children. It should not be used by persons with hypertension, arrhythmias, or other severe cardiac conditions. The FDA considers this herb unsafe.

Side Effects/Adverse Reactions

CNS: Headache, mind-altering effect (smoking)
CV: *Arrhythmias*
GI: *Hepatotoxicity*

Side Effects/Adverse Reactions—cont'd

Overdose: *Nausea, vomiting, dizziness, confusion, tachycardia, shock*

Reproductive: Uterine contractions and spasms, *spontaneous abortion*

Interactions

Drug

Antiarrhythmics, antihypertensives, cardiac glycosides: Broom may increase the effect of antiarrhythmics, antihypertensives, and cardiac glycosides; do not use concurrently.

Antidiabetics *(glyburide, insulin, miglitol):* Broom decreases the hypoglycemic effect of these agents; avoid concurrent use.

MAOIs: Scotch broom may cause hypertensive crisis when used with MAOIs; do not use concurrently (Jellin et al, 2008).

Lab Test

AST, ALT, alkaline phosphatase, creatinine: Broom may increase these levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid	Sparteine	Antiarrhythmic IA; oxytoxic
Flavone glycoside	Scoparoside	Diuretic
	Kaempferol; Quercetin derivatives	Antiinflammatory
	Oxysparteine; Spiraeoside; Lupanine; Genitoside; Isoquercetin	
Isoflavone	Sarothamnoside	
Caffeic acid derivative		
Essential oil		

Client Considerations

Assess

- Assess the reason the client is taking broom medicinally.
- Assess cardiac status (blood pressure; pulse, including character; rhythm). Identify any other cardiac agents (antiarrhythmics, antihypertensives, cardiac glycosides) the client is taking.
- Identify MAOIs the client is taking; broom should not be used with MAOIs because of high tyramine content.
- Assess for overdose symptoms such as nausea, vomiting, dizziness, confusion, tachycardia, and shock. If any of these symptoms are present, use of this herb should be discontinued immediately.

Administer

- Inform the client that there is no consensus on dosage.

Teach Client/Family

- Because broom can cause spontaneous abortion, caution the client not to use this herb during pregnancy.
- Advise the client not to use broom in children or those who are breastfeeding until more research is available.
- Caution the client that the FDA considers this herb unsafe because of its hepatotoxic effects.
- Caution the client that using this herb to induce abortion is unsafe; a follow-up therapeutic abortion may be needed.
- Teach the client the symptoms of overdose (nausea, vomiting, dizziness, confusion, tachycardia, shock).

Buchu

(boo′choo)

Scientific names: *Barosma betulina (Agathosma betulina), Barosma serratifolia, Barosma crenulata*

Other common names: Agathosma, betuline, bocco

Origin: Buchu is found in South Africa.

Uses

Buchu is used as a diuretic and an antiseptic, and for the treatment of the common cold, stomachaches, rheumatism (Simpson, 1998), gout, leukorrhea, yeast infections, and urinary tract infections, including cystitis. Buchu is also used in combination with uva-ursi for benign prostatic hyperplasia.

Actions

No substantial information exists to document any of the actions or uses of this herb.

Diuretic Action

Two of the flavonoid components of buchu, diosphenol and terpen-4-ol, may be responsible for its diuretic action. However, diosphenol and terpen-4-ol are not considered to be a more powerful diuretic than caffeine or any other xanthane product (Simpson, 1998).

Antibacterial Action

A douche made from an infusion of buchu leaves may be used as an antibacterial treatment for yeast infections and leukorrhea. Diosphenol may be responsible for the antibacterial effect (Chevallier, 1996). One study suggests there is little potential for buchu to be used as an antimicrobial (Lis-Balchin, 2001).

Other Actions

One of the flavonoids, quercetin, is an antiinflammatory. Pulegone is a powerful abortifacient.

Product Availability

Decoction, dried leaves, fluid extract, tablets, tincture

Plant Part Used: Leaves

Dosages

- Adult PO infusion: 3-6 g dried leaves/day (Mills, Bone, 2000)
- Adult PO tea: 1 cup of tea (1 g dry leaf in 150 ml of water, boil 5-10 min, strain) given several times per day (Jellin et al, 2008)
- Adult PO fluid extract: 2-4 ml/day (1:2 dilution) (Mills, Bone, 2000)
- Adult PO tincture: 5-10 ml/day (1:5 dilution) (Mills, Bone, 2000)

Contraindications

Pregnancy category is 3; breastfeeding category is 3A.
Buchu should not be given to children. It should not be used by persons with severe hepatic or renal disease.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, diarrhea, *hepatotoxicity*
GU: Increased menstrual flow, *spontaneous abortion, nephritis*

Interactions

Drug

Anticoagulants *(heparin, warfarin),* ***antiplatelets:*** Buchu can increase the action of anticoagulants, antiplatelets causing bleeding; avoid concurrent use.
Antidiabetics*(glyburide, insulin, miglitol):* Buchu decreases the hypoglycemic effect; avoid concurrent use.

Lab Test

AST, ALT, alkaline phosphatase, PT, INR: Buchu may increase these levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Flavonoid	Diosphenol	Antibacterial; diuretic
	Quercetin	Antiinflammatory
	Diosmin; Rutin; Diosmetin; Terpene-4-ol	
Volatile oil	Pulegone	Hepatotoxicity; abortifacient
Limonene Menthone		Diuretic
Mucilage		
Resin		
Coumarin		

Client Considerations

Assess

- Assess the reason the client is taking buchu medicinally.
- Assess hepatic function test results (ALT, AST, bilirubin); buchu can cause hepatotoxicity. Watch for jaundice, right upper-quadrant pain, and clay-colored stools. If symptoms occur, use of this herb should be discontinued.
- Assess for use of anticoagulants (see Interactions).

Diuretic Use

- Assess urinary status (intake and output, bladder distention, pain, burning during urination); watch for beginning nephritis. If these symptoms occur, use of this herb should be discontinued.

Administer

- Instruct the client to take PO as dried leaves, infusion, fluid extract, or tincture. Buchu should not be boiled; boiling robs the herb of its healing properties.
- Instruct the client to store buchu in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 3A.
- Advise the client not to use buchu in children.
- Advise the client to report changes in urinary status, jaundice, and stool color.

Buckthorn

(buhk'thawrn)

Scientific name: *Rhamnus cathartica*

Other common names: Common buckthorn, European buckthorn, hartsthorn, purging buckthorn, waythorn

Origin: Buckthorn is found in Canada, Europe, and the United States.

Uses

Buckthorn is used as a powerful laxative.

Actions

Laxative Action

The laxative action of the anthranoid components of buckthorn is well documented in the mainstream pharmacologic literature. This action results from direct chemical irritation of the colon, which increases the rate at which stool is propelled through the bowel. A similar laxative herb is cascara.

Product Availability

Crushed herb, syrup

Plant Parts Used: Bark, fruit

Dosages

- Adult PO: 20-30 mg hydroxyanthracene derivative (glucofrangulin A) (Blumenthal, 1998)

Contraindications

Class 2b/2c/2d herb.

Buckthorn should not be used during pregnancy and breastfeeding and should not be given to children younger than 12 years of age. This herb should not be used by elderly persons or persons with the following disorders: colitis, irritable bowel syndrome, Crohn's disease, gastrointestinal obstruction, unknown abdominal pain, appendicitis, gastrointestinal bleeding, hepatic disease. Dehydration and electrolyte loss may occur if buckthorn is used for more than 8 to 10 days.

Side Effects/Adverse Reactions

CNS: Nervousness, tremors
GI: Nausea, vomiting, diarrhea, anorexia, abdominal cramps; possible hepatotoxicity (Lichtensteiger et al, 1997)
META: Dehydration, fluid and electrolyte imbalances (with increased dose or increased duration)
RESP: Decreased respirations

Interactions

Drug

Antacids: Antacids may decrease the action of buckthorn if taken within 1 hour of the herb.
Antiarrhythmics, cardiac glycosides *(digoxin):* Chronic buckthorn use can cause hypokalemia and enhance the effects of antiarrhythmics, cardiac glycosides; do not use concurrently.
Corticosteroids, thiazide diuretics: Hypokalemia can result from use of buckthorn with corticosteroids, thiazide diuretics; do not use concurrently.

Herb

Jimsonweed: The action of jimsonweed is increased in cases of chronic abuse of buckthorn.
Other herbs: Hypokalemia can result from the use of buckthorn with adonis, convallaria, helleborus, licorice root, and strophanthus; avoid concurrent use (Brinker, 1998).

Food

Milk: Milk may decrease the action of buckthorn; avoid concurrent use.

Lab Test

Dipstick urine tests: May alter results; urine may be pink, red, or orange (Jellin et al, 2008).
Potassium: Buckthorn may decrease potassium levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Anthranoid	Emodin	Laxative
Anthraquinone glycosides	Frangulin A, B; Glucofrangulin A, B	Laxative

Client Considerations

Assess

- Assess the reason the client is taking buckthorn medicinally.
- Assess blood and urine electrolytes if the client uses this herb often.
- Assess the cause of constipation; identify whether bulk, fluids, or exercise is lacking.
- Assess for cramping, rectal bleeding, nausea, and vomiting. If these symptoms occur, buckthorn use should be discontinued.
- Assess for medications and herbs used (see Interactions).

Administer

- Instruct the client not to take buckthorn within 1 hour of other drugs, antacids, or milk. This herb should be taken with other herbs to buffer its effects and prevent griping.

Teach Client/Family

- Caution the client not to use buckthorn in children younger than 12 years of age and those who are pregnant or breastfeeding.
- Advise the client to avoid long-term use of buckthorn (for <8-10 days), which can result in the loss of bowel tone.
- Instruct the client to notify the provider if constipation is unrelieved or if symptoms of electrolyte imbalance occur (muscle cramps, pain, weakness, dizziness).
- Advise the client that urine may turn pink, red, or orange.

Bugleweed

(byew'guhl-weed)

Scientific names: *Lycopus virginicus, Lycopus europaeus*

Other common names: Carpenter's herb, common bugle, Egyptian's herb, farasyon maiy, gypsy-weed, gypsy-wort, lycopi herba, menta de lobo, middle comfrey, Paul's betony, sicklewort, su ferasyunu, water bugle, water horehound

Origin: Bugleweed is a member of the mint family found in Europe and the United States.

Uses

Bugleweed is used as an astringent and analgesic, and as a treatment for Graves' disease, fever, tachycardia, and mastodynia. Mild forms of hyperthyroidism can be successfully treated with bugleweed.

Actions

Antithyroid Action

Bugleweed has been shown to inhibit thyroid-stimulating hormone (TSH), Graves' immunoglobulin, and iodothyronine deiodinase (Brinker, 1990; Winterhoff et al, 1994). One study demonstrated pronounced antithyroid activity, pronounced peripheral T_4 conversion, and decreased thyroid secretion independent of TSH activation (Auf'mkolk et al, 1984). These actions differ from those of the traditional antithyroid agents and may be due to the phenols lithospermic and rosmarinic acids.

Other Actions

Bugleweed has shown antigonadotropic actions and an ability to decrease prolactin. A significant decrease occurred in both luteinizing hormone (LH) and testosterone levels when *Lycopus europaeus* extract was given orally. This action may be due to the phenols lithospermic and rosmarinic acids. Bugleweed has been shown to decrease the binding of human chorionic gonadotropin (hCG) to rat testes (Auf'mkolk et al, 1984). This research indicates that bugleweed may also exert contraceptive effects.

Product Availability

Dried herb, fluid extract, tincture

Plant Parts Used: Flowers, leaves (dried and fresh), roots, stems. The leaf extract contains a much higher concentration of the active components than does the root extract.

Dosages

- Adult PO dried herb: 1-3 g tid
- Adult PO fluid extract: 1-3 ml (1:1 dilution in 25% alcohol) tid
- Adult PO infusion: 1-3 g dried herb, infused, tid
- Adult PO tincture: 2-6 ml (1:5 dilution in 45% alcohol) tid (British Herbal Pharmacopoeia, 1983)

Contraindications

Pregnancy category is 5; breastfeeding category is 5A.

Bugleweed should not be given to children. Persons with thyroid tumors, hypopituitarism, pituitary adenoma, hypogonadism, congestive heart failure, or hypothyroidism should avoid the use of this herb.

Side Effects/Adverse Reactions

ENDO: Hypothyroidism, enlarged thyroid gland (high doses)

Interactions

Drug

Antidiabetics: Bugleweed given with antidiabetes agents may lead to increased hypoglycemia (Jellin et al, 2008).

Thyroid preparations: Bugleweed can interfere with the action of thyroid preparations; do not use concurrently.

Herb

Wildthyme, balmleaf: Wild thyme, balmleaf can suppress the effects of the thyroid, additive effects when used with bugleweed; avoid concurrent use.

Lab Test

Radioactive isotopes: Bugleweed can interfere with procedures using radioactive isotopes (Jellin et al, 2008).

Prolactin, glucose: Bugleweed may decrease these levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Phenol	Lithospermic acid; Rosmarinic acid	Antithyroid; antigonadotropic
	Chlorogenic acid; Caffeic acid; Ellagic acid; Ursolic acid; Sinapinic acid; Hydrocinnamic acid	
Flavone	Luteolin-7-glucoside	
Amino acid		
Mineral		
Sugar		

Continued

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Tannin		Wound healing; antiinflammatory
Phenolic acids	Caffeic acid	

Client Considerations

Assess

- Assess the reason the client is taking bugleweed medicinally.

Treatment of Graves' Disease

- Assess the client's thyroid panel (T_3, T_4, T_7, TSH levels). Bugleweed should not be used in place of antithyroid agents.
- Assess for the use of antithyroid agents. Bugleweed should not be used with other thyroid medications but may be used with other antithyroid herbs (see Interactions).
- Assess for nervousness, excitability, and irritability.
- Check the client's weight, blood pressure, and pulse weekly. Check for puffiness of the periorbits, hands, and feet, which may indicate hypothyroidism.

Administer

- Instruct the client to take this herb at the same time each day to maintain blood levels.
- Instruct the client to store bugleweed in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 5 and breastfeeding category is 5A.
- Caution the client not to use bugleweed in children.
- Caution the client not to use bugleweed with thyroid products or radioisotopes.
- Teach the client how to keep a graph of weight, pulse, and mood.
- Teach the client the symptoms of continuing hyperthyroidism: diarrhea, fever, irritability, sleeplessness, intolerance to heat, and tachycardia.
- Instruct the client to inform all other health care providers of herbs taken.

Burdock

(buhr'dahk)

Scientific names: *Arctium lappa, Arctium minus*

Other common names: Bardane, beggar's buttons, clotbur, cockle buttons, cuckold, edible burdock, fox's clote, gobo, great bur, great burdock, happy major, hardock, lappa, love leaves, personata, philanthropium, thorny burr, wild gobo

Origin: Burdock is a perennial found in China, Europe, and the United States.

Uses

Burdock seeds are used for their hypotensive, myodepressant, and renotropic properties. Burdock roots are used for their hypoglycemic, antiseptic, toxicopectic, and antitumor actions. Burdock is used for skin disorders such as psoriasis, eczema,

poison ivy, boils, and canker sores. Burdock compresses can soothe the swelling of arthritis, rheumatism, and hemorrhoids. It is also commonly used in food, especially in Chinese populations (Jellin et al, 2008).

Actions

Burdock's actions include a depurative, mild laxative, and mild diuretic (Mills, Bone, 2005).

Hypoglycemic Action

The inulin content of burdock root makes up approximately 60% of its weight. When used to treat diabetes in rats, *Arctium lappa* extract caused a long-lasting reduction in blood glucose and an increased tolerance of carbohydrate (Lapinina et al, 1964).

Antimicrobial Action

The roots of *Arctium* spp. have demonstrated antibacterial activity against *Staphylococcus* spp., and two compounds present in the fresh root have been found to possess antifungal and antibacterial properties. *Arctium* was active in vitro against the gram-negative organisms *Escherichia coli* and *Pseudomonas aeruginosa;* against the gram-positive organism *Staphylococcus aureus;* and against the fungi *Microsporum gypseum, Trichophyton* spp., and *Epidermophyton floccosum* (Reisch et al, 1967; Pereira et al, 2005; Gentil et al, 2006). These actions were lost when the roots were dried.

Antitumor Action

A polymer from burdock root may assist in the prevention of cancer by decreasing mutagens, possibly by adsorption (Morita et al, 1984, 1985). An extract of *A. lappa* root also decreased tumor growth (Foldeak et al, 1964). Burdock showed antiproliferative and apoptotic effects by action of arctigenin, one of the compounds in this herb (Matsumoto, 2006).

Other Actions

One study identified a hepatoprotective effect of burdock. Mice were injected with carbon tetrachloride or acetaminophen. *A. lappa* was able to reverse hepatic effects (Lin et al, 2000, 2002).

Product Availability

Capsules: 425, 475 mg; cream; salve; fluid extract; root; tea; tincture

Plant Parts Used: Dried roots (most active, used part), leaves, seeds

Dosages

- Adult PO decoction: 1 cup tid-qid
- Adult PO fluid extract: 1-3 ml bid
- Adult PO tincture of root: 3-5 ml bid-qid
- Adult topical: apply as compress or as a cream prn

Contraindications

Pregnancy category is 2; breastfeeding category is 2A.

Burdock may be used in children. It should not be used by persons who are hypersensitive to this plant. Burdock should be used cautiously by persons with diabetes or cardiac disorders.

Side Effects/Adverse Reactions

CV: Hypotension

ENDO: Hypoglycemia

Continued

Interactions

Drug

***Antidiabetics** (glyburide, insulin, miglitol):* An increased hypoglycemic effect can occur when burdock is taken with antidiabetics; avoid concurrent use.

Antihypertensives, calcium channel blockers: Burdock may possibly increase the hypotensive effect of antihypertensives, calcium channel blockers; avoid concurrent use.

Lab Test

Blood glucose: Burdock may decrease blood glucose level.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Carbohydrate		
Insulin		Hypoglycemia
Tannin		Wound healing; antiinflammatory
Polyphenolic acid		
Volatile acid		
Nonhydroxy acid		
Polyacetylene	Arctiopiricin	Antimicrobial
Glycoside	Anthroquinones	
Gamma-guanidino-*n*-butyric acid		
Lactone glycoside	Arctiin	Antinephrotic; central nervous system stimulant; hypotensive
Lignan	Arctigenin	Antiproliferative, apoptotic
	Matairesinol (a lignan)	
	A; B; C; D; E; F; Neoarctin	Calcium antagonist; hypotensive
Daucosterol		
Matairesinol		
Lappaol		
Arctigenin		
Xyloglucan		
Root		Active against gram-negative bacteria
Leaves, flowers		Active against gram-positive and gram-negative bacteria

Client Considerations

Assess

- Assess the reason the client is using burdock.
- Monitor blood pressure and blood glucose levels while the client is taking this herb.

- Assess for the use of antidiabetics, antihypertensives, and calcium channel blockers (see Interactions).

Administer

- Instruct the client to store burdock in a tight container away from sunlight and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 2 and breastfeeding category is 2A.
- Inform the client that burdock may be used in children.

Butcher's Broom

(bu′chuhrz brewm)

Scientific name: *Ruscus aculeatus*

Other common names: Box holly, knee holly, pettigree, sweet broom

Origin: Butcher's broom is an evergreen found in the Mediterranean and the southern region of the United States.

Uses

Butcher's broom has been used as a laxative and diuretic, to treat varicose veins, peripheral vascular disease, arthritis, hemorrhoids, leg edema, diabetic retinopathy, carpal tunnel syndrome, and to relieve inflammation.

Investigational Uses

Butcher's broom may be used for orthostatic hypotension and chronic venous insufficiency.

Actions

Butcher's broom's actions are antiinflammatory venotonic (Mills, Bone, 2005).

Venous Action

Several research studies have focused on the use of butcher's broom to treat varicose veins. In fact, when *Ruscus aculeatus* was given with ascorbic acid and hesperidin to 40 patients with chronic phlebopathy of the lower limbs, an immediate and significant positive change (improvement of the varicose veins) occurred (Cappelli et al, 1988). Another study investigated the antielastase and antihyaluronidase effect of two chemical components present in *R. aculeatus,* the saponins and sapogenins. This study demonstrated a remarkable antielastase activity that could help improve venous insufficiency (Facino et al, 1995). The peripheral vascular effects of butcher's broom appear to be mediated selectively by calcium channels and alpha-1–adrenergic receptors (Bouskela et al, 1994). More recent studies (Vanscheidt et al, 2002; Aguilar et al, 2007) confirm older studies in the use of butcher's broom for chronic venous insufficiency.

Antimicrobial Action

One study tested the use of 20 Palestinian plant species used in folk medicine, including *R. aculeatus.* The research tested these 20 herbs against *Staphylococcus aureus, Escherichia coli, Klebsiella pneumoniae, Proteus vulgaris, Pseudomonas aeruginosa,* and *Candida albicans.* Of the 20 plants tested, *R. aculeatus* was the least effective against *Candida albicans* and demonstrated limited activity against the other organisms (Ali-Shtayeh et al, 1998).

Other Actions

One study (Redman, 2000) identified the positive effect of butcher's broom in orthostatic hypotension. Butcher's broom is an alpha-adrenergic agonist. The chemical components ruscogenin and neoruscogenin may be responsible for this action.

Product Availability

Capsules: 75, 100, 150, 400, 470, 475 mg; fluid extract; ointment; suppositories (available in Europe); tablets; tea

Plant Parts Used: Dried rhizome, dried roots, leaves

Dosages

- Adult PO: 7-11 mg total ruscogenin (Blumenthal, 1998)
- Adult PO tea: 1 heaping tsp/1 cup water
- Adult topical ointment: apply to area as needed

Chronic Venous Insufficiency

- Adult PO root extract: 150 mg with 150 mg hesperidin with 100 mg ascorbic acid bid (Jellin et al, 2008)

Other dosages are not consistently delineated in the literature.

Contraindications

Class 1 herb.

Pregnancy category is 2; breastfeeding category is 2A.

Butcher's broom should not be given to children (no data available). Persons with benign prostatic hypertrophy (BPH) and hypertension should avoid the use of this herb.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, gastritis (rare)

Interactions

Drug

Alpha-adrenergic blockers: Butcher's broom may decrease the action of alpha-adrenergic blockers; avoid concurrent use.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Steroidal saponin	Phytosterol; Glucopyranosyl Ruscin	
	Ruscogenin; Neoruscogenin	Vascoconstrictor
Coumarin		
Sparteine		
Tyramine		Increased vasopressor effect
Glycolic acid		
Anthraquinone		Laxative
Euparone		

= Pregnancy = Pediatric = Alert = Popular Herb

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Ethanol **Fatty acid** **Benzofuranes**	Euparone, Ruscodibenzofurane	

Client Considerations

Assess

- Determine whether the client is using butcher's broom to treat venous insufficiency. If so, assess for symptoms (pain, swelling of legs when standing or sitting). If symptoms are present, check for constrictive clothing before administering herb.
- Assess for hypertension or BPH. Avoid administering this herb to clients with these conditions.

Administer

- Instruct the client to take as a tea, in capsule form, or as a fluid extract.
- Instruct the client to store butcher's broom in a cool, dry place, away from moisture and heat.

Teach Client/Family

- Inform the client that pregnancy category is 2 and breastfeeding category is 2A.
- Caution client not to give butcher's broom to children (no data available).

Butterbur

(buh'tuhr-buhr)

Scientific names: *Petasites hybridus, Petasites officinalis, Tussilago petasites*

Other common names: Blatterdock, bog rhubarb, bogshorns, European pestroot, flapperdock, langwort, sweet coltsfoot, umbrella leaves, western coltsfoot

Origin: Butterbur is a perennial found in Europe and Asia.

Uses

Butterbur is used to treat respiratory conditions such as asthma, whooping cough, and coughs resulting from other respiratory illnesses. It is used as a diuretic, sedative, and treatment for irritable bowel syndrome and arthritis. Butterbur is also used topically for wound healing. Use in the United States is uncommon.

Investigational Uses

Researchers are experimenting with the use of butterbur to treat migraine headaches, urinary tract spasms resulting from calculosis, prevention of gastric ulcers, and seasonal allergic rhinitis (Schapowal, 2002; Thome et al, 2002).

Actions

Antimigraine Action

One study showed that a group of migraine sufferers who received butterbur experienced a 56% reduction in the number of migraine headaches. In addition, the headaches experienced by this group were of shorter duration than those experienced by participants who received a placebo (Eaton, 1998). Butterbur extract was more effective than a placebo and is well tolerated to prevent migraines (Lipton et al, 2004).

Antispasmodic Action

The active chemical components petasin and isopetasin may be responsible for the antispasmodic action of butterbur, which includes reduction of spontaneous activity and spasm in the smooth muscle system. Butterbur thus may have the potential for treating urinary tract spasms resulting from calculosis (Eaton, 1998).

Carcinogenesis Action

The butterbur root contains pyrrolizidine alkaloids, which in animal studies have been linked to the development of cancer and hepatotoxicity. The recommendation is that human daily intake of pyrrolizidine alkaloids not exceed 1 mcg (Reglin et al, 1998). New formulas of butterbur are available in which the pyrrolizidine alkaloid content is well below this recommended level (pyrrolizidine alkaloid–free *Petasites* sp.).

Other Actions

Studies have shown that butterbur may be used for seasonal allergic rhinitis, without sedative effects of traditional antihistamines (Schapowal, 2002; Thome, 2002). Butterbur possesses COX-2 inhibitors and may be used for inflammatory conditions (Fiebich et al, 2005).

Product Availability

Capsules: 25 mg; cigarette; extract; fluid extract; fresh leaves

Plant Parts Used: Flowers, leaves, roots, stems

Dosages

- Adult PO infusion: pour boiling water over 1.2-2 g of herb, steep 10 min, strain, drink 2-4 oz as often as qid (Moore, 1996)
- Adult PO fluid extract: 1-3 ml tid (1:2 dilution) (Moore, 1996)
- Adult topical: apply fresh leaves as a poultice prn

Contraindications

Butterbur should not be used during pregnancy and breastfeeding. It should not be given to children. Persons with decreased gastrointestinal or genitourinary motility should avoid the use of this herb; symptoms may worsen. The pyrrolizidine alkaloids in this herb can cause irreversible hepatic damage.

Side Effects/Adverse Reactions

EENT: Color change of sclera
GI: Nausea, vomiting, anorexia, abdominal pain, color change of stools, constipation, *hepatotoxicity*
GU: Difficulty in urination
INTEG: Color change of skin
RESP: Dyspnea, shortness of breath
SYST: *Carcinogenesis (resulting from high levels of pyrrolizidine alkaloids)*

Interactions

Drug

Anticholinergics, antimigraine agents, beta-blockers: The effects of anticholinergics, antimigraine agents, and beta-blockers may be enhanced by the use of butterbur; avoid concurrent use.

Herb

Pyrrolizidine alkaloid (UPA)-containing herbs: Butterbur may add to toxicity (Jellin et al, 2008).

Lab Test

Hepatic function tests: Butterbur may increase hepatic function tests (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid	Petasin; Isopetasin	Antispasmodic; antiinflammatory
	Pyrrolizidine	Hepatotoxic
	Oxopetasin esters; Senecionine; Integerrimine; Senkirkine	
Volatile oil		
Sesquiterpenes	Pethybrene; Petasitene	
Pectin mucilage		
tannins		

Client Considerations

Assess

- Assess the reason the client is taking butterbur medicinally.
- Assess for hepatotoxicity: increased hepatic function test results (AST, ALT, bilirubin), clay-colored stools, and upper-quadrant pain. If symptoms are present, discontinue use of butterbur immediately.
- Assess for medications used (see Interactions).

Administer

- Instruct the client to take PO, use topically, or smoke.
- Instruct the client to store butterbur in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use butterbur in children or those who are pregnant or breastfeeding until more research is available.
- Caution the client not to use excessive doses of this herb; carcinogens are present in the pyrrolizidine alkaloids.
- Caution the client not to confuse the leaves of butterbur with those of other *Petasites* spp.

Cacao Tree

(kuh-kau′ tree)

Scientific name: *Theobroma cacao*

Other common names: Cacao, chocolate, cocoa, cocoa butter

Origin: The cacao tree is found in Mexico and is cultivated in other parts of the world.

Uses

Cacao is used extensively in food and drink. The flavonoids in cacao are potent diuretics, mild central nervous system stimulants, and cardiac stimulants. Cacao is not used therapeutically by herbalists or naturopaths. It has been used topically (cocoa butter) to treat wrinkles and prevent stretch marks in pregnancy.

Investigational Uses

New studies are confirming that cacao flavanols reduce the risk for cardiovascular disease (Balzer et al, 2008; Erdman et al, 2008).

Actions

Cacao has been used for centuries as a food and as a flavoring for food and drink.

Antioxidant Action

Cacao may exert significant antioxidant effects because of one of its chemical components, catechin, a flavonoid also found in black tea. Catechin has been shown to increase immune response and decrease mutagenesis (Waterhouse et al, 1996).

Stimulant Action

Since cacao contains xanthines, which are also present in coffee and tea, it acts as a mild central nervous system stimulant. It also acts as a cardiac stimulant and produces a mild diuretic effect. Theobromine, a chemical component of cacao, is one of the weakest xanthines.

Cardiovascular Action

Two new studies (Balzer et al, 2008; Erdman et al, 2008) showed a decrease in cardiovascular risk when cocoa flavanols were consumed on a regular basis in those with a significant cardiovascular risk or those who were diabetic. The regular consumption can reverse vascular dysfunction in diabetes.

Product Availability

Butter, extract, powder, syrup

Plant Part Used: Seeds

Dosages

Dosages are not clearly delineated in the literature.

Contraindications

Until more research is available, consumption of cacao should be avoided by persons with hypersensitivity to this herb; persons with irritable bowel syndrome, gastroesophogeal reflux disease, or colitis; pregnant or breastfeeding women; and children. Persons with anxiety disorders should avoid large amounts. Consumption of cacao in large amounts may cause death in animals.

= Pregnancy = Pediatric = Alert = Popular Herb

Side Effects/Adverse Reactions

Cacao is generally well tolerated when taken in reasonable amounts, although it may cause hypersensitivity or side effects in some individuals.

Interactions

Drug

MAOIs: The tyramine content in cacao may increase the vasopressor effect of MAOIs; do not use concurrently.

Theophylline: Cacao may decrease the metabolism of xanthines such as theophylline, thereby increasing theophylline levels; do not use concurrently.

Herb

Ephedra, guarana, yerba maté: Cacao may increase the effects of these products.

Food

Coffee, tea, cola: Cacao may increase central nervous system stimulation when used with caffeinated foods and drinks.

Lab Test

Catecholamines, VMA levels, bleeding time: Cacao in large amounts may cause increased catecholamines, VMA levels, bleeding time.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Flavonoid	Catechin	Antioxidant, CV protectant
	Epicatechin	
Alkaloid	Theobromine	Central nervous system stimulant; diuretic
	Caffeine	Cardiac stimulant
	Tyramine	Increased vasopressor effect
	Trigonelline	
	Polysaccharides (Redgwell et al, 2000)	

Client Considerations

Assess

- Assess the reason the client is using cacao tree medicinally.
- Assess for hypersensitivity to chocolate. Individuals with this hypersensitivity should not use cacao.
- Assess for cardiovascular disease, colitis, and irritable bowel syndrome. Individuals with these conditions should not use cacao in large amounts.
- Assess for the use of MAOIs and theophylline (see Interactions).
- Monitor blood pressure: blood pressure may be elevated.

Administer

- Instruct the client to store cacao in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use cacao medicinally in children or in those who are pregnant or breastfeeding until more research is available.
- Caution the client to keep cacao-containing products away from pets.

Calcium

(kal′-see-um)

Scientific name: Calcium, Ca

Other common names: Bone meal, calcium acetate, calcium carbonate, calcium citrate, calcium gluconate, calcium gluceptate, calcium lactate

Origin: Calcium is a naturally occurring element.

Uses

Calcium is used as an antacid, in osteoporosis prevention, and for calcium supplementation, and to prevent and treat hypocalcemia, hypermagnesemia, hypoparathyroidism, and vitamin D deficiency.

Actions

Calcium is cation needed for maintenance of nervous, muscular, and skeletal function, enzyme reactions, normal cardiac contractility, coagulation of blood, secretory activity of exocrine and endocrine glands.

Product Availability

Tablets, capsules

Dosages

Antacid

- Adult PO: 0.5-1.5 g 1 hr after meals and bedtime

Prevention of Hypocalcemia, Depletion, Osteoporosis

- Adult PO: 1-2 g daily

Contraindications

Calcium should not be used in fluid restriction, dehydration, or breastfeeding.

Side Effects/Adverse Reactions

GI: Constipation, anorexia, nausea, vomiting, flatulence, diarrhea, rebound hyperacidity, eructation

Pharmacology

Pharmacokinetics

Onset 20 minutes, duration up to 2 hours, crosses placenta, excreted in urine and feces, bioavailability of calcium products differ widely (Hanzlik et al, 2005).

Client Considerations

Assess

- Assess the reason client is using calcium.

Administer

- Keep calcium in a dry area, away from direct sunlight.

Teach Client/Family

- Teach the patient that calcium may be used in pregnancy and breastfeeding and may be given to children.

Calumba

(kal-um′ba)

Scientific names: *Jateorrhiza calumba, Jateorrhiza palmata*

Other common names: *Cocculus palmatus,* columbo root, calumba root

Origin: Calumba is found only in Madagascar and Mozambique.

Uses

Calumba has traditionally been used to treat diarrhea and flatulence. It is an old, eclectic herb from South Africa whose use is uncommon in the United States.

Actions

Very little research is available documenting any uses or actions of calumba. There are no human studies for any use, and for that reason the use of this herb is not recommended. Calumba has been used in Africa as a dye for clothing and a flavoring for food. Columbin, one of the chemical components, may be responsible for sedative effects.

Product Availability

Capsules, tincture

Plant Part Used: Roots

Dosages

- Adult PO infusion: 1-2 oz tid (Moore, 1996)
- Adult PO tincture: 1-2 ml before meals (1:5 dilution) (Moore, 1996)

Contraindications

Until more research is available, calumba should not be used during pregnancy and breastfeeding. It should not be given to children.

Side Effects/Adverse Reactions

CNS: High doses: sedation, *coma, paralysis*
GI: Vomiting

Interactions

Drug

Antacids, H_2-blockers, proton pump inhibitors: Calumba may decrease the action of antacids, H_2-blockers, and proton pump inhibitors (theoretical) (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Columbamine **Jateorhizine**		

Continued

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Palmatine Alkaloid Columbin		Sedative

Client Considerations

Assess

- Determine the reason the client is using calumba.

Administer

- Instruct the client to store calumba in a tightly sealed container.

Teach Client/Family

- Caution the client not to use calumba in children or in those who are pregnant or breastfeeding until more research is available.

Capsicum

(kap'si-kuhm)

Scientific names: *Capsicum frutescens, Capsicum annum*

Other common names: Capsaicin, cayenne pepper, chili pepper, hot pepper, paprika, pimento, red pepper, tabasco pepper

Origin: Capsicum is found in tropical areas of the Americas.

Uses

Capsicum is used topically to treat diabetic neuropathy, psoriasis, postmastectomy pain, Raynaud's disease, herpes zoster, arthritis, muscular pain, and poor peripheral circulation. It is used internally as a gastroprotective agent in peptic ulcer disease, to reduce cholesterol and blood clotting, to promote cardiovascular health, and to treat coronary artery disease, the common cold, flu, and vascular congestive conditions. Capsicum is commonly used by herbalists in the United States as an adjunct where vasodilation or warmth is needed.

Actions

Gastroprotective Action

Capsaicin, one of the chemical components of capsicum, was found to protect against *Helicobacter pylori*–associated gastrointestinal disease. Test results have shown that doses similar to those that can be achieved in the diet are sufficient to provide the anti–*H. pylori* action (Jones et al, 1997). Also, capsicum can protect the stomach against gastric mucous damage if taken 30 minutes before aspirin dose (Jellin et al, 2008).

Pain Relief Action

Topical capsicum preparations are used to relieve muscular pain and the pain associated with arthritis and a variety of other conditions (Keitel et al, 2001). The chemical components responsible for pain relief are the capsaicinoids. The

most effective of these is capsaicin (Cordell et al, 1993), which can alter P-mediated pain transmission. Research has shown that capsaicin cream is an effective and safe treatment for relief of the pain associated with diabetic neuropathy (Tandan et al, 1992).

Possible Cardiovascular Actions

Research on rats has shown cardiovascular responses such as hypotension, decreased heart rate, and vasodilation that may be due to the tachykinins in capsaicin. Capsaicin acts on the vanilloid receptors found in many tissues (Cuprian et al, 1998).

Enhanced Immunity Action

In one study, rats were divided into five groups and fed various amounts of capsaicin in their diets. The rats that were fed a medium level of capsaicin (20 ppm) showed an increase in the T-cell mitogen-induced lymphocyte proliferative response, and an increase in B-cell, immunoglobulin G (IgG), immunoglobulin M (IgM), and tissue necrosis factor-alpha (TNF-alpha) levels, suggesting an increased immune function (Yu et al, 1998).

Product Availability

Capsules, tablets: 400, 500 mg; cream: 0.025%, 0.075%, 0.25% concentrations; gel: 0.025% concentration; lotion: 0.025%, 0.075% concentrations; spice; spray: 5%, 10% concentrations; tincture

Plant Part Used: Dried fruit

Dosages

Pain Relief

- Adult topical: apply cream (0.025%-0.075% concentration) for at least 2 wk for beginning pain relief; may use up to qid

Other

- Adult PO capsules/tablets: 400-500 mg daily tid
- Adult PO tincture: 5-15 drops in water qid (1:5 dilution) (Moore, 1996).

Contraindications

Class 1 herb (internal use); class 2d herb (external use).

Until more research is available, capsicum should not be used internally, medicinally during pregnancy and breastfeeding. It should not be used by persons with hypersensitivity, and should not be given to children. This herb should not be used on open wounds or abrasions, or near the eyes. It is extremely vesicant in undiluted form.

Side Effects/Adverse Reactions

GI: Gastrointestinal cramping, pain, diarrhea (internal use)
INTEG: Severe burning, itching, and stinging that lessen with each application; painful irritation of mucous membranes (all topical use)
MISC: Sweating, running nose, tearing of eyes (internal use)

Interactions

Drug

Alpha-adrenergic blockers: Capsicum may decrease the action of alpha-adrenergic blockers; avoid concurrent use.

Continued

Interactions—cont'd

Clonidine, methyldopa: Capsicum may decrease the antihypertensive effects of clonidine, methyldopa; avoid concurrent use.
MAOIs: Capsicum may precipitate hypertensive crisis when used with MAOIs; do not use concurrently.
Topical products: There are no known drug interactions of topical capsicum preparations with other topical products.

Herb

Feverfew, garlic, ginkgo, ginseng: Capsicum may increase the risk for bleeding.

Lab Test

Coagulation time: Capsicum may cause increased coagulation time.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil	Capsaicin	Pain relief; anti–*Helicobacter pylori*
Capsaicinoid	Lutein	Antioxidant
	Capsanthin; Capsorubin; Carotene; Oleoresin; Resiniferatoxin; 3,6-Epoxide	
Saponins	Capsicoside E, F, G	Antimicrobial
Protein		
Fat		
Vitamin	A; C	
Provitamin	E	Antioxidant
	P; B_1; B_2; B_3	

Client Considerations

Assess

- Assess the reason the client is using capsicum medicinally.
- Assess for gastrointestinal conditions such as peptic ulcer, irritable bowel syndrome, and colitis. Some recent research has identified gastroprotective effects of capsicum; however, other researchers believe capsicum should not be used if the aforementioned conditions are present (see Actions).
- Assess for improvement in the symptoms of diabetic neuropathy, psoriasis, or herpes zoster if the client is using capsicum for any of these conditions.
- Determine whether the client is using MAOIs or antihypertensives. Capsicum should not be used concurrently with these medications (see Interactions).

Administer

- Instruct the client to use topically as soon as pain is starting to return. The stinging and burning sensations that some people experience with topical capsicum products should subside after repeated applications.

Teach Client/Family

- Caution the client not to use capsicum in children or those who are pregnant or breastfeeding until more research is available.

Caraway

(kar'uh-way)

Scientific name: *Carum carvi* L.

Other common names: Kummel, kummelol, oleum cari, oleum carvi

Origin: Caraway is a biennial herb grown in Europe, Siberia, the Himalayas, parts of Asia, and now in the United States.

Uses

Caraway has been used traditionally for gastrointestinal disorders such as flatulence, constipation, abdominal distention, irritable bowel syndrome, dyspepsia, colic, heartburn, indigestion, and stomach ulcers, and as a gargle for laryngitis. It is also used for the common cold, bronchitis, and to relieve menstrual cramps (Jellin et al, 2008).

Investigational Uses

Studies are underway for antiinfective uses against *Bacillus, Pseudomonas, Candida,* and *Dermatomyces,* as an antineoplastic and a diuretic.

Actions

Antispasmodic Action

The effects of peppermint oil used in conjunction with caraway oil are comparable with cisapride for treating dyspepsia. Both peppermint and caraway oils were well tolerated and produced a minimum of side effects. Caraway oil has been shown to be effective in treatment of *Helicobacter pylori* infections, epigastric pain, and gastric ulcers (Khayyal et al, 2001; Madisch et al, 1999; Mickelfield et al, 2000).

Antimicrobial Action

When tested on animals, caraway demonstrated effectiveness against *Bacillus, Pseudomonas, Candida,* and *Dermatomyces* spp. and other gram-positive and gram-negative organisms (Hopf et al, 1977; Iacobellis et al, 2005).

Antiulcergenic Action

In one study, 32 patients with duodenal ulcers or gastroduodenitis were given several laxative herbs, including caraway. Patients with obstipation syndrome improved (Matev et al, 1981).

Other Actions

Strong diuretic action was identified in the lab using normal rats. The actions are furosemide-like and thiazide-like (Lahlou et al, 2007).

Product Availability

Tea, capsules, oil, volatile oil, seeds, water, powder, infusion

Plant Part Used: Seeds

Dosage

- Adult PO essential oil: 1-4 drops in a tsp of water or on a sugar cube before meals
- Adult PO seeds: 1.5-6 g finely crushed seeds, chewed and swallowed
- Adult PO infusion: use to make infusion bid-tid between meals; press 1-2 tsp of finely ground seeds, add 150 ml of hot water, let steep 10-15 min before straining and drinking

Contraindications

Class 1 herb.

Caraway should not be used in hypersensitivity or gastroesophageal reflux disease or during pregnancy (uterine relaxation may occur) (theoretical).

Side Effects/Adverse Reactions

GI: Anorexia, diarrhea, hepatic dysfunction
GU: Renal dysfunction
INTEG: Redness, irritation, contact dermatitis

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Glucosides **Monoterpenoides** **Volatile oil**	Janipediol; L-Fucitol Terpene; D-Limonene; Ketone Ketone, D-Carvone; Terpene; D-Limonene	Chemoprotective

Client Considerations

Assess

- Assess the reason the client is using caraway medicinally.

Administer

- Protect from light and moisture; place in metal or glass containers.

Teach Client/Family

- Teach the client that caraway should not be used medicinally in pregnancy (uterine relaxation may occur), in breastfeeding, or for children until more research is available.

Cardamom

(kahr'duh-muhm)

Scientific name: *Elettaria cardamomum*

Other common names: Cardamom seeds, Malabar cardamom

Origin: Cardamom is a perennial found in India.

Uses

Cardamom is an aromatic used to treat dyspepsia, colic, flatulence, irritable bowel syndrome, gallstones, viruses, the common cold, cough, bronchial congestion, and anorexia. It is most commonly used therapeutically by Ayurvedic practitioners.

Actions

Enhanced Skin Permeation

One study showed that cardamom oil enhances skin permeation for indomethacin. Pretreating the skin with cardamom oil for 5 min greatly enhanced the permeation of indomethacin (Huang et al, 1999). Much research is underway to identify which crude herb extracts increase permeation.

Gastroprotective Action

Cardamom is used in the Unani system of medicine to treat gastrointestinal disorders. When cardamom was tested in the lab using rats, the gastric lesions induced by aspirin, ethanol, and pylorous ligature were significantly reduced, some by 100% (Jamal et al, 2006). The volatile oils in cardamom exert antispasmotic and antiflatulent properties.

Product Availability

Fluid extract, powder, seeds (dried and whole), tincture

Plant Part Used: Seeds

Dosages

Recommended dosages vary widely.

- Adult PO fluid extract: 10-30 drops before meals
- Adult PO powder: 15-30 grains before meals
- Adult PO tincture: 5-10 drops prn or before meals (Moore, 1996); 1-2 g/day (Jellin et al, 2008)
- Adult PO whole seeds: 1.5 g (Blumenthal, 1998) chewed before meals
- Adult PO ground seeds: 1.5 g per day (Jellin et al, 2008)

Contraindications

Class 1 herb.

Until more research is available, cardamom should not be used during pregnancy and breastfeeding. It should not be given to children. Persons with gastroesophageal reflux disease should avoid the use of cardamon. Persons with gallstones should use this herb with caution.

Side Effects/Adverse Reactions

GI: Gallstone colic

INTEG: Contact dermatitis (rare)

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil	Cineol Linalyl acetate Alpha-terponyl	Antispasmodic, antiviral, antiflatulent

Continued

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Linalool **Alpha-pinene** **Limonene** **Myrcene**		Analgesic

Client Considerations

Assess

- Assess the reason the client is taking cardamom medicinally.
- Assess for contact dermatitis; if present, discontinue use of cardamom.

Administer

- Instruct the client to store cardamom away from sunlight and moisture.
- Instruct the client to take right before meals.

Teach Client/Family

- Caution the client not to use cardamom in children or those who are pregnant or breastfeeding until more research is available.
- Advise the client not to exceed the recommended dosage.

Carline Thistle

(kahr'luhn thi'suhl)

Scientific name: *Carlina acaulis*

Other common names: Dwarf carline, felon herb, ground thistle, southernwood root, stemless carline root, carlina

Origin: Carline thistle is found in Europe.

Uses

When used internally, carline thistle is used as a mild diuretic, diaphoretic, spasmolytic, an antimicrobial against *Staphylococcus aureus,* and for the treatment of gallbladder disease. It is used topically to treat dermatosis, wounds, ulcers, and cancer of the tongue (Tamuki et al, 1994). Carline thistle is also used to treat herpes and toothaches (Jellin et al, 2008).

Actions

Very little research exists on carline thistle. Most of the available information is anecdotal. The volatile oil may have an antibacterial action.

Product Availability

Liquid, tea, tincture

Plant Parts Used: Leaves, roots, seeds

Dosages

- Adult PO decoction: 3 g herb in 150 ml water, boil 5 min, 1 cup tid
- Adult PO infusion: 2 tbsp herb in 8 oz water, boil 15 min and let stand ½ hr; 1 cup tid between meals

= Pregnancy = Pediatric = Alert = Popular Herb

- Adult PO tincture: 20 g chopped herb in 80 g ethanol (60%), let stand 10 days, 40 drops qid
- Adult topical liquid: may be applied prn

Contraindications

Until more research is available, carline thistle should not be used during pregnancy and breastfeeding. It should not be given to children.

Side Effects/Adverse Reactions

CNS: *Pain, spasms, seizures (overdose)*

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil		Antibacterial
Inulin		Hypoglycemia
Tannin		Wound healing; antiinflammatory

Client Considerations

Assess

- Assess the reason the client is using carline thistle medicinally.
- Assess for symptoms of overdose: pain, spasms, seizures. If these symptoms occur, use of carline thistle should be discontinued.

Administer

- Instruct the client to store carline thistle in a sealed container away from sunlight and moisture.

Teach Client/Family

- Caution the client not to use carline thistle in children or those who are pregnant or breastfeeding until more research is available.
- Inform the client that very little scientific research is available to support claims for the therapeutic use of carline thistle.
- Advise the client not to confuse carline thistle with other *Carlina* spp.

Carnitine

(kahr′nuh-teen)

Scientific names: L-Carnitine

Other common names: LPT, LAT, ALC

Origin: Synthetic. It is found in its natural state in food.

Uses

Carnitine is used for angina, congestive heart failure, Alzheimer's disease, other types of dementia, post myocardial infarction, and to improve athletic performance.

Actions

Carnitine is needed in the body for the transport of fatty acids into the cell.

Cardiovascular Action

Several studies have identified the positive results of carnitine in post myocardial infarction recovery, intermittent claudication, angina, and congestive heart failure. All studies point to the improvement in ventricular hypertrophy, decreased angina attacks, and decreased mortality (Davini et al, 1992; Illicento et al, 1995; Singh et al, 1996). Significant improvement in walking distance was reported in those diagnosed with intermittent claudication (Bolognesi et al, 1996; Brevett et al, 1999). Another study (Spasov et al, 2006) using lab rats showed normalization in myocardial function in contractibility, relaxation, blood pressure, maximal isometric loading test, after a carnitine-deficient diet was replaced with a carnitine-rich diet.

Other Actions

Carnitine has also shown positive results in Alzheimer's disease and other dementias (Bonavita, 1986; Calvani et al, 1992). Beginning research has shown carnitine to be beneficial in decreasing the harmful effects from antiretroviral therapy in HIV (Semino-Mora et al, 1994), in preterm infants with recurrent apnea (Kumar et al, 2004), and in wound healing (Koybasi et al, 2005).

Product Availability

Tablets

Dosage

- Adult PO: 1500-6000 mg tid

Contraindications

The effects of carnitine are not known in severe hepatic/renal disease. Recommended amounts are not known for children, or those who are pregnant or breastfeeding.

Side Effects/Adverse Reactions

ENDO: Myasthenia gravis–like symptoms (DL-carnitine)
GI: Anorexia, nausea, vomiting, diarrhea, abdominal pain

Interactions

Drug

Thyroid hormones: Carnitine may inhibit the effects of thyroid hormone replacement therapy; avoid concurrent use.
Valproic acid *(Depakane, Depakote, valproate):* These drugs can induce L-carnitine deficiency (Jellin et al, 2008).

Lab Test

HDL, lymphocytes, serum triglycerides: Carnitine may cause increased CD4, CD8 lymphocyte count in those not treated with antiretrovirals; increased HDL cholesterol in children on hemodialysis; or decreased serum triglyceride in children on hemodialysis (Jellin et al, 2008).

Client Considerations

Assess

- Assess the reason the client is using carnitine.
- Monitor cardiac status, if client is using as a supplement in angina, post myocardial infarction, or congestive heart failure.
- Monitor mental status if client is using carnitine for dementia.

Administer

- Keep carnitine in a cool, dry area, away from excessive light.

Teach Client/Family

- Teach the client that it is not known how much carnitine is needed for children, or those who are pregnant or breastfeeding.

Cascara

(ka-skar'uh)

Scientific name: *Rhamnus purshiana*

Other common names: Californian buckthorn, sacred bark

Origin: Cascara is found along the coast in the Pacific Northwest region of the United States.

Uses

Cascara is used as a laxative.

Actions

Laxative Action

The laxative action of the anthraglycosides in cascara is well documented in the mainstream pharmacologic literature. This action results from direct chemical irritation in the colon, which increases the propulsion of stool through the bowel.

Product Availability

Capsules, fluid extract, tea, tincture

Plant Part Used: Dried aged bark

Dosages

Laxative

- Adult PO: 20-30 mg hydroxyanthracene (cascaroside A), one-time dose (Blumenthal, 1998)
- Adult PO tincture: 1-2 tsp (5-10 ml) (1:5 dilution), one-time dose (Moore, 1996)

Contraindications

Pregnancy category is 3; breastfeeding category is 3A.

Cascara should not be given to children. Use of this herb is contraindicated when gastrointestinal bleeding, obstruction, abdominal pain, nausea, vomiting, appendicitis, or Crohn's disease are present. Cascara should not be used by those who are hypersensitive to this product.

Continued

Side Effects/Adverse Reactions

GI: Nausea, vomiting, diarrhea, abdominal cramps, laxative dependency
GU: Urine discoloration; hematuria, albuminuria (high doses, extended use)
MS: Osteomalacia
SYST: Vitamin and mineral deficiencies, fluid and electrolyte imbalances (high doses, extended use)

Interactions

Drug

Antacids: Antacids may decrease the action of cascara if taken within 1 hour of the herb.
Antiarrhythmics, cardiac glycosides *(digoxin):* Chronic cascara use can cause hypokalemia and enhance the effects of antiarrhythmics, cardiac glycosides; do not use concurrently.
Corticosteroids, thiazide diuretics: Hypokalemia can result from use of cascara with corticosteroids, thiazide diuretics; avoid concurrent use.

Herb

Adonis, convallaria, helleborus, horsetail, licorice root, strophanthus: Use with cascara may lead to hypokalemia; avoid concurrent use.
Aloe, castor, blackroot, blue flag, buckthorn, butternut, rhubarb, senna, wild cucumber, yellow dock: Increased laxative effect when used with these herbs (Jellin et al, 2008).
Digitalis, lily of the valley, squill: Use with cascara can lead to cardiac toxicity.

Food

Milk: Milk may decrease the action of cascara; avoid concurrent use.

Lab Test

Serum and 24-hour urine estrogens: Cascara may increase or decrease test values.
Potassium levels: Cascara may reduce potassium levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Anthraglycoside	Cascarosides A, B, C, D Barbaloin; Deoxybarbaloin; Chrysaloin	Laxative
Emodin glycoside		Laxative

Client Considerations

Assess

- Assess blood and urine electrolytes if the client uses this herb often.
- Assess the cause of constipation: determine whether fiber, fluids, or exercise is missing from the client's lifestyle.
- Assess for cramping, rectal bleeding, nausea, and vomiting; if these symptoms occur, discontinue use of cascara.

- Assess for all medications and herbs taken by client; evaluate if drug interactions could occur (see Interactions).

Administer

- Instruct the client not to take cascara within 1 hour of other drugs, antacids, or milk. This herb should be taken with a carminative to prevent griping.

Teach Client/Family

- Inform client that pregnancy category is 3 and breastfeeding category is 3A.
- Caution the client not to use cascara in children, or those who are pregnant or breastfeeding until more research is available.
- Advise the client to avoid long-term use of cascara because it can cause loss of bowel tone.
- Instruct the client to notify the provider if constipation is unrelieved or if symptoms of electrolyte imbalance occur (muscle cramps, pain, weakness, dizziness).
- Teach patient that urine may turn pink or orange.

Castor

(kas′tuhr)

Scientific name: *Ricinum communis*

Other common names: African coffee bean, bofareira, castor bean, castor oil plant, Mexico seed, Mexico weed, palma Christi, tangantangan oil plant, wonder tree, wunderbaum

Origin: Castor is a perennial found in India and Africa.

Uses

Castor oil is used internally as a laxative, an emetic, a gastrointestinal antiinflammatory agent, and an anthelmintic. It is also used to treat leprosy and syphilis (Scarpa et al, 1982). Externally, it is used to treat boils, abscesses, carbuncles, tumors, inflammation of the middle ear, and migraine headaches. Castor may be used topically to stimulate the resolving of toughened tissue and wound healing. Castor is also used to induce labor.

Investigational Uses

Studies are ongoing to determine the effectiveness of castor as a contraceptive.

Actions

Laxative Action

The laxative action of castor occurs as a result of its ability to increase fluid in the colon and stimulate peristalsis, which results in increased propulsion of stool through the colon. Castor can be used to empty the colon completely of stool, as is necessary to expel worms.

Contraceptive Action

Reports confirm that women in Korea, India, Algiers, and Egypt have used castor beans in some form to prevent pregnancy. Some Egyptians believe that pregnancy will be prevented for at least 9 months if a woman consumes one castor seed after her baby is born. (NOTE: This practice could be extremely toxic.) One recent study evaluated the contraceptive action of castor beans in female rabbits. The rabbits were treated with 7.5 mg/kg of castor for 10 days, then mated with proven male rabbits. The treated rabbits showed a 4.3-fold decrease in pregnancy (Salhab et al, 1997).

Product Availability

Oil emulsion in concentrations of 36.4%, 60%, 67%, and 95%; oil liquid in 100% concentration; purge in 95% concentration

Plant Part Used: Seeds

Dosages

- Adult PO: 15-60 ml daily
- Adult topical oil pack: apply prn bid for up to 2 wk

Contraindications

Class 2b/2d herb.

Castor should not be used during pregnancy and breastfeeding. It should not be given to children. Persons with hypersensitivity to castor or with gastrointestinal disorders such as obstruction or bleeding, irritable bowel syndrome, appendicitis, Crohn's disease, undiagnosed abdominal pain, and biliary tract disorders/obstructions should avoid the use of this herb.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, abdominal cramps
META: Fluid and electrolyte imbalances (chronic use)
REPRODUCTIVE: Induce labor
SYST: Allergic reactions

Interactions

Drug

Antacids, other drugs: To prevent decreased absorption of castor, do not take within 1 hour of antacids and other drugs.
Cardiac glycosides (digoxin): Use with castor oil may lead to increased cardiac adverse reactions (theoretical) (Jellin et al, 2008).
Corticosteroids, diuretics: Use with castor oil may increase hypokalemia (theoretical) (Jellin et al, 2008).
Laxatives: Use with castor oil may lead to electrolyte imbalances (Jellin et al, 2008).

Herb

Licorice, horsetail, stimulant laxative herbs: Used with castor oil may lead to hypokalemia (Jellin et al, 2008).

Food

Milk: To prevent decreased absorption of castor, do not take within 1 hour of milk.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Fatty oil **Lectin** **Pyridine alkaloid**	Ricin D	Toxic
Triglyceride **Tocopherol**	Ricinoleic acid; oleic acid	

Client Considerations

Assess

- Assess blood and urine electrolytes if this herb is used often.
- Assess for the cause of constipation: determine whether bulk, fluids, or exercise are missing from the client's lifestyle.
- Assess for cramping, nausea, and vomiting. If these symptoms occur, discontinue use of castor.

Administer

- Instruct the client to take castor alone for better absorption. It should not be taken within 1 hr of other drugs, antacids, or milk.

Teach Client/Family

- Caution the client not to use castor in children or those who are pregnant or breastfeeding.
- Advise the client to avoid the long term use of castor because it can cause loss of bowel tone, as well as severe nutrient depletion and electrolyte loss.
- Instruct the client to notify the provider if constipation is unrelieved or if symptoms of electrolyte imbalance occur (muscle cramps, pain, weakness, dizziness).

Catnip

(kat′nip)

Scientific name: *Nepeta cataria*

Other common names: Cataria, catmint, catnep, cat's play, catwort, field balm, nip

Origin: Catnip is a perennial found in the United States.

Uses

Catnip is used internally to treat migraines, anxiety, colic, insomnia, the common cold, menstrual cramps, digestive disorders, asthma, and influenzae. It is used externally to treat arthritis and hemorrhoids. Catnip is commonly used only to treat mild conditions and is often given to infants and children.

Investigational Uses

Catnip may be used to inhibit infections of *Staphylococcus aureus* (Nostro et al, 2001).

Actions

Very little research is available on the actions of catnip. Most reports are anecdotal.

Sedative Action

One of the chemical components of catnip, nepetalactone (a volatile oil), may be responsible for the sedative, calming effect of catnip. These effects are similar to those of valerian. Catnip is best known for the reaction cats have to it and the euphoria that results (Hatch, 1972). Its calming effects on humans make *Nepeta cataria* useful for treating anxiety, digestive disorders, and colic (Chevallier, 1996).

Antiinflammatory Action

Anecdotal reports are available that document the topical use of catnip to improve the inflammation seen in arthritis and joint conditions (Chevallier, 1996). Currently, no primary research studies are available to substantiate these claims.

Antimicrobial Action

An extract of *N. cataria* was tested on 44 *Staphylococcus aureus* strains. There was significant inhibition of these organisms (Nostro et al, 2001).

Product Availability

Capsules: 360 mg; dried leaves; elixir; liquid; tea; tincture; available in combination with other herbs.

Plant Parts Used: Dried leaves, flowers

Dosages

- Adult PO infusion: 10 tsp dried leaves in 1 L water, cover while steeping, allow to stand 10 min; 2-6 oz tid (Moore, 1996)
- Adult PO tincture: 1-5 ml tid (Moore, 1996)

Asthma Attacks

- Child PO: steep one small handful of lobelia and catnip in a quart of boiling water for 30 min; serve hot ¼-½ cup at a time, as needed; watch for side effects for 15 min before repeating (Romm, 2000).

Antipyretic

- Child PO: prepare 1 oz of catnip to 1 quart of water, steep, strain; may be used in infants (Romm, 2000).

Contraindications

Class 2b herb.

Catnip should not be used during pregnancy because of its possible mild uterine stimulant action.

Side Effects/Adverse Reactions

CNS: Headache, malaise

GI: Nausea, vomiting, anorexia

Interactions

Drug

Alcohol, CNS depressants: The effects of alcohol, CNS depressants (Jellin et al, 2008) may be enhanced when used with catnip.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil	Nepetalactone Camphor; Epinepetalactone; caryophyllene; Thymol; Carvacrol	Sedative; antispasmodic
Tannin		Wound healing; antiinflammatory

= Pregnancy = Pediatric = Alert = Popular Herb

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Terpenoids Sterols	Alpha-amyrin, Beta-amyrin	Dancosterol, beta-sitosterol, campesterol (Klimek et al, 2005)

Client Considerations

Assess

- Assess for the reason the client is using catnip medicinally.
- Assess for possible pregnancy. Because of its uterine stimulant action, catnip should not be used during pregnancy.
- Assess for menstrual irregularities such as increased flow and pain.
- Assess for the use of alcohol and sedatives (see Interactions).

Administer

- Instruct the client to take catnip internally as an infusion or use topically.

Teach Client/Family

- Caution the client not to use catnip during pregnancy because of its possible mild uterine stimulant action.
- Advise the client that catnip may be given to infants and children.

Cat's Claw

(kats klaw)

Scientific names: *Uncaria tomentosa, Uncaria guianensis*

Other common names: Life-giving vine of Peru, samento, una de gato

Origin: Cat's claw is a member of the madder family and is found in South America and Southeast Asia.

Uses

Cat's claw is used today as an immune system stimulant, an antiinflammatory, and a contraceptive. It is used to treat arthritis, irritable bowel syndrome, colitis, and Crohn's disease.

Actions

Antiinflammatory Action

Cat's claw is used widely in traditional Peruvian medicine. It inhibits the production of the proinflammatory cytokine, TNF-alpha, which is a critical mediating of the immune response (Allen-Hall et al, 2007). However, little else is known about this herb from a purely scientific standpoint.

Immunostimulant Action

In Europe, cat's claw is used in combination with antiviral drugs to treat AIDS patients. However, no scientific research confirms this use. The immunostimulant action of cat's claw may be due to the combined actions of several of

its chemical components, but no research confirms that possibility. In one limited study, cat's claw bark was shown to inhibit the growth of leukemia cells in humans without damaging normal healthy bone marrow (Stuppner et al, 1993). Another study demonstrated the ability of cat's claw to increase phagocytosis, thereby increasing the immune system (Wagner et al, 1985). Cat's claw shows enhancement of DNA repair, mitogenic response, and leukocyte recovery after chemotherapy-induced DNA-damage in human volunteers (Sheng et al, 2001). This study confirms another study using laboratory animals (Sheng et al, 2000).

Product Availability

Capsules: 500, 600 mg; root (powdered and raw); tablets (standardized extract): 25, 150, 175, 300, 350 mg

Plant Parts Used: Leaves, roots, stem bark

Dosages

- Adult PO bark (traditional Peruvian dose): 20-30 g finely chopped, then boiled in 1 L water ½ hr and allowed to stand until it reaches room temperature, tid
- Adult PO capsules/tablets: may be taken in amounts up to 5400 mg/day in divided doses
- Adult PO decoction: 1 tbsp powdered root in 1 qt water, simmered 45 min; 1 tsp in hot water qAM, before meals
- Adult PO tincture: 20-40 drops up to qid; tincture may be standardized to contain 3% total oxindole alkaloids and 15% total polyphenol

Contraindications

Pregnancy category is 6; breastfeeding category is 3A.

Until more research is available, cat's claw should not be given to children younger than 3 years of age. Persons with multiple sclerosis, tuberculosis, AIDS, or hemophilia and those who have had organ transplants or who have other autoimmune disorders should not use this herb.

Side Effects/Adverse Reactions

CV: Hypotension

GI: Diarrhea

Interactions

Drug

Antihypertensives: Cat's claw may increase the hypotensive effects of antihypertensives; avoid concurrent use.

Hormones (animal), insulin, plasma (fresh), vaccines (passive): Cat's claw may interact with hormones made from animal products, insulin, fresh plasma, passive vaccines composed of animal sera (Foster, 1995); avoid concurrent use.

Immunostimulants: Do not use cat's claw with other immunostimulants (Jones, 1995).

Immunosuppressants: Cat's claw should not be used with immunosuppressants; immunosuppressant therapy will be decreased (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Oxindole alkaloid	Isopteropodine; Pteropodine; Isomitraphylline	Immune stimulant
	Rhynchophylline	Decrease hypertension, heart rate, cholesterol
	Mytraphylline	Diuretic
	Hirsutine	Bladder contractions
	Gambirine	Cardiovascular
	Isorynchophylline; Uncarine F	
Indole alkaloid	Glucosides; Cadambine; 3-Dihydrocadambine; 3-Isodihydrocadambine	
Quinovic acid glycoside		Antiviral; antiinflammatory
Tannin		Wound healing; antiinflammatory
Proanthocyanidin		
Polyphenol		
Catechin		
Beta sitosterol		
Indole alkaloid	Carboxystrictosidine	

Client Considerations

Assess

- Assess the reason the client is using cat's claw medicinally.
- Assess for decreasing blood pressure. If the decrease is significant, discontinue use of cat's claw. Determine whether the client is using antihypertensives, which will lower blood pressure further.
- Assess for recent use of vaccines, hormones, insulin, or fresh plasma, all of which may contraindicate the use of this herb. In Europe, use of these drugs is considered a contraindication to the use of cat's claw (see Interactions).

Administer

- Instruct the client to use only standardized cat's claw products if possible.

Teach Client/Family

- Inform the client that pregnancy category is 6 and breastfeeding category is 3A.
- Advise client not to give cat's claw to children until more research is available.
- Instruct the client to have blood pressure checked regularly while taking this herb.

Celandine

(seh'luhn-deen)

Scientific name: *Chelidonium majus*

Other common names: Celandine poppy, common celandine, felonwort, garden celandine, greater celandine, rock poppy, swallow wort, tetter wort, wart wort

Origin: Celandine is a member of the poppy family found in Asia, North America, and Europe.

Uses

Flowers and leaves of celandine are used to treat spastic conditions of the gastrointestinal tract. Celandine is also used as a liver and gallbladder tonic, to stimulate digestion, and to decrease inflammation. Roots of celandine are used to treat irregular menses and to decrease pain of toothache, tooth extraction.

Investigational Uses

Researchers are experimenting with the use of celandine to strengthen the immune system and to treat cancer and AIDS.

Actions

Antispasmodic Action

In studies using frogs and mice, a celandine extract reduced gastralgia and pain from gastric ulcers. Chelidonium has been shown to stimulate bile flow when tested in guinea pigs (Rentz, 1948). It also has been shown to relieve histamine-induced spasms in guinea pigs (Kustrak et al, 1982).

Nonspecific Immune Stimulation

Celandine may act as a chemoprotective agent for stomach cancer in humans. One study using 6-week-old rats showed that celandine inhibited glandular stomach carcinogenesis (Kim et al, 1997). One celandine product that is used in Europe but is not approved in the United States is Ukrain, which is reported to be an antitumor product that acts by inhibiting RNA and DNA replication (Ukranian Anticancer Institute, 1997; Habermehl et al, 2006).

Antimicrobial Action

Several research articles have discussed the powerful antimicrobial effects of celandine. Its effectiveness has been demonstrated against *Candida pseudotropicalis, Microsporum gypseum, Microsporum canis, Trichophyton mentagrophytes, Epidermophyton floccosum,* and *Streptococcus mutans* (Cheng et al, 2006) using herbs gathered during the fall harvest (Vukusic et al, 1991). The strength of the herb varies depending on the season of harvest.

Product Availability

Extract, tea, tincture

Plant Parts Used: Flowers, leaves, roots

Dosages

- Adult PO: 2-5 g herb (12-30 mg total alkaloids as chelidonine) daily (Blumenthal, 1998; Jellin et al, 2008)

- Adult PO tincture: 10-25 drops, up to 1 ml (1:2 dilution) tid (Moore, 1996)
- Adult PO fluid extract: 1-2 ml tid (Jellin et al, 2008)
- Adult topical extract: apply to warts and corns full strength

Contraindications

Class 2b/2d herb.

Celandine should not be used during pregnancy and breastfeeding. It should not be given to children. Celandine should not be given to those with biliary obstruction, glaucoma, or hepatic disease. If used alone, this herb is for short-term use only; if used in a formula, it can be used long term (Moore, 1996).

Side Effects/Adverse Reactions

CNS: Dizziness, drowsiness, fatigue, lethargy, insomnia, restlessness
CV: Hypotension
GI: Nausea, *hepatotoxicity (mild to severe)*
GU: Polyuria, polydipsia
INTEG: Stabbing or itching sensation at lesion

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid	Chelidonine	Reverse T-helper cell deficiency, proapoptotic (Habermehl et al, 2006)
	Chelerythrine; Sanguinarine; Lectin	Antimicrobial

Client Considerations

Assess

- Assess the reason the client is using celandine medicinally.
- Assess for hepatotoxicity (increased hepatic function test results, clay-colored stools, right upper-quadrant pain, jaundice). If present, discontinue use of celandine.

Administer

- Instruct the client to store celandine in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use celandine in children or those who are pregnant or breastfeeding until more research is available.
- Teach the client to recognize the symptoms of hepatotoxicity: clay-colored stools, jaundice, and right upper-quadrant pain.

Celery

(seh'luh-ree)

Scientific name: *Apium graveolens*

Other common names: Apium, celery seed, celery seed oil, marsh parsley, smallage, wild cherry

Origin: Celery is a biennial found worldwide.

Uses

Celery seeds are used to treat hypertension, seizure disorders, as a diuretic, and to stimulate labor. Celery juice is used to treat edema, hypertension, joint inflammation, anxiety, and headache. Celery is also used to treat diabetes and has an antiplatelet activity. Therapeutic use in the United States is uncommon.

Actions

Antihypertensive/Anticholesterol Action

Studies using dogs have shown that celery products lower the levels of circulating dopamine, norepinephrine, and epinephrine. This action is believed to result from the ability of celery to inhibit tyrosine hydroxylase. These findings support the traditional use of celery as an antihypertensive (Le Ot et al, 1992). Drinking aqueous celery extract for 8 weeks caused a significant reduction in serum total cholesterol in rats. The action was due to increased bile acid excretion (Tsi et al, 2000).

Anticonvulsant Action

One of the chemical components of celery, an alkaloid, has been shown to be an effective anticonvulsant (Yu et al, 1984). In one study, celery seeds were able to protect rats and mice from seizures initiated by chemical, audio, and electric means. The seeds contain an alkaloid that exerts both anticonvulsant and central nervous system depressant actions (Kulshrestha et al, 1970).

Other Actions

Studies have shown that apigenin, one of the chemical components of celery, exerts a strong antiplatelet effect and also inhibits the formation of thromboxane B (Teng et al, 1988). Information has also become available regarding the antifungal effects of celery (Jain et al, 1973). In addition, the oil may possess hypoglycemic and antitumor effects. Caution needs to be exercised with the use of celery in geriatric patients, because celery allergy has been underestimated (Untersmayr et al, 2008).

Product Availability

Capsules: 450, 505 mg; seeds; tincture

Plant Parts Used: Seeds, whole plant

Dosages

- Adult PO: ½-1 tsp seeds in 1 cup hot water tid (Moore, 1996)
- Adult PO: 1-2 ml 2-5 times/day (Smith, 1999)

Contraindications

Pregnancy category is 3; breastfeeding category is 3A.
Celery seeds should not be given to children except as a food source. Persons with allergies to birch or mugwort and those with kidney inflammation should never use celery products.

Side Effects/Adverse Reactions

CNS: *Central nervous system depression*
GU: Uterine stimulation
INTEG: Dermatitis, *phototoxic bullous lesions (birch-celery syndrome)*
SYST: *Hypersensitivity reactions, anaphylaxis, angioedema*

Interactions

Drug

Anticoagulants, antiplatelets: When given with celery, there is an increased risk of bleeding (theoretical) (Jellin et al, 2008).
Antihypertensives, diuretics: Celery may increase the effect of these products.
CNS depressants: When used with celery, effects may be increased (theoretical) (Jellin et al, 2008).
Thyroid replacement: Celery may decrease the effect of thyroid hormone replacement (Jellin et al, 2008).

Herb

Anticoagulant/antiplatelet herbs *(angelica, anise, arnica, bogbean, boldo, capsicum, chamomile, clove, fenugreek, feverfew, garlic, ginger, ginkgo, ginseng [Panax], horse chestnut, horseradish, licorice, meadowsweet, prickly ash, onion, passionflower, poplar, red clover, turmeric, willow):* When used with celery there is an increased risk of bleeding (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Mineral	Sodium	Maintain electrolyte balance
	Chlorine	
D-Limonene		
Selinene		
Phthalide		Hypotensive
Flavonoid	Luteolin	Antiinflammatory
	Apigenin	Antiplatelet; histamine inhibitor
Nitrate		
Alkaloid		Anticonvulsant
Furanocoumarins	Xanthotoxin; Bergapten (Lombaert et al, 2001)	

Client Considerations

Assess

- Assess the reason the client is using celery medicinally.
- Assess for hypersensitivity reactions, including birch-celery syndrome and anaphylaxis.
- Assess the client's level of consciousness; central nervous system depression can occur.

Administer

- Instruct the client that celery seeds and juice are used to treat different conditions.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 3A.
- Caution the client not to use celery products in children except as a food source.
- Inform clients with allergies to birch or mugwort, and those with kidney inflammation, never to use celery products.
- Advise the client to stay out of the sun or to wear protective clothing when using celery products. Psoralen, one of the chemical components of celery, may cause a phototoxic rash.

Centaury

(sen'taw-ree)

Scientific names: *Centaurium erythraea, Centaurium umbellatum, Centaurium minus*

Other common names: Bitter clover, bitter herb, bitterbloom, centaurea, common centaury, European centaury, eyebright, feverwort, filwort, lesser centaury, minor centaury

Origin: Centaury is an annual or biennial member of the Gentian family found in Europe.

Uses

Centaury is used to treat dyspepsia, lack of gastric secretions, and loss of appetite. In traditional herbal medicine, centaury is used as an anthelmintic, an antidiabetic, an antihypertensive, and a treatment for kidney stones. No scientific evidence supports any of these uses or actions. Centaury may be given to infants and children to treat anxiety, insomnia, tension, colic, irritable bowel syndrome, and topical inflammation. It may also be used to treat symptoms of attention deficit hyperactivity disorder (Romm, 2000). Centaury is commonly used in the United Kingdom and Australia; its use is less common in the United States.

Actions

No supporting evidence exists to document any actions of this herb. However, initial studies have suggested that the xanthone chemical components in centaury may show promise as antioxidants and that they may possess some antiinflammatory properties, although these are thought to be weak. The phenolic acid may be an antipyretic, and gentiopicroside, a monoterpenoid, is an antimalarial.

Product Availability

Fluid extract, powder, whole herb

Plant Parts Used: Flowers, leaves, stem

Dosages

- Adult PO fluid extract: 1-3 ml taken before meals (1:5 dilution) (Hobbs, 1995)
- Adult PO cold infusion: 1-2 oz tid (Moore, 1996)
- Adult PO tea: steep 2-4 g in 150 ml boiling water (Jellin et al, 2008)
- Adult PO powder: 1 g taken tid with honey on a cracker
- Adult PO tincture: 0.5-1 ml taken before meals (1:2 dilution) (Moore, 1996)
- Adult PO whole herb: 1-2 g taken daily

Contraindications

Class 1 herb.

Until more research is available, centaury should not be used during pregnancy and breastfeeding. Persons with gastric or peptic ulcers should not use this herb.

Side Effects/Adverse Reactions

GI: Anorexia

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid	Gentianine; Gentianidine; Gentioflavine	
Monoterpenoid	Iridoids; Bitters; Gentiopicroside; Centapicrin; Gentioflavoside; Sweroside; Swertiamarin	Antimalarial
Triterpenoid	Alpha-amyrin; Beta-amyrin; Erythrodiol; Crataegolic acid; Oleanolic acid; Oleanolic lactone; Sitosterol; Stigmasterol; Campesterol; Brassicasterol	
Phenolic acid		Antipyretic
Flavonoid		
Xanthone	Eustomin; Demethyleustomin	Antioxidant
Fatty acid	Palmitic acid; Stearic acid	

Client Considerations

Assess

- Determine the reason the client is using centaury.

Administer

- Instruct the client to store centaury away from light and moisture.

Teach Client/Family

- Caution the client not to use centaury during pregnancy and breastfeeding until more research is available.
- Caution the client not to confuse the three *Centaurium* spp. listed in the Scientific names section with other *Centaurium* spp. They are different herbs.
- Inform the client that no supporting research is available to document any uses for or actions of this herb.

Chamomile

(ka′muh-meel)

Scientific names: *Matricaria chamomilla, Matricaria recutita, Chamaemelum nobile, Anthemis nobile*

Other common names: Common chamomile, English chamomile, German chamomile, Hungarian chamomile, Roman chamomile, sweet false chamomile, true chamomile, wild chamomile

Origin: Chamomile is a perennial found in Europe.

Uses

Chamomile is used as an antiinflammatory and to treat insomnia, anxiety, and spasms. It is commonly used to treat digestive conditions such as irritable bowel syndrome, indigestion, colitis, and Crohn's disease. Chamomile is used as a topical treatment to promote wound healing.

Investigational Uses

Studies are underway to determine the effectiveness of chamomile as an antioxidant and as a treatment for menopausal symptoms.

Actions

Chamomile is a widely recognized herb in Western culture. The medicinal use dates back many centuries. Chamomile is calming, carminative, and antispasmotic (*Altern Med Rev,* 2008).

Antianxiety Action

One of the flavonoid components of chamomile, apigenin, has shown an affinity for benzodiazepine receptors, which accounts for the antianxiety and sedative qualities of this herb (Viola et al, 1995; Medina et al, 1998). Two other studies have shown a mild hypnotic effect in laboratory animals as a result of the flavonoid component (Berry, 1995; Mills, Bone, 1991). Multiple studies have documented the ability of chamomile to decrease anxiety and promote relaxation and sleep.

Antidiabetes Action

Evidence has demonstrated that two flavonoids in chamomile, glucoside and chamaemeloside, produce hypoglycemic effects (Konig, 1998). However, the current recommended dose for humans of 0.05% to 0.1% is too low to have any significant effect on glucose levels.

Phytoestrogen Action

One study evaluated the efficacy of 13 isoflavonoids, flavonoids, and lignans, plus several phytoestrogens, in the treatment of estrogen-dependent tumors. Apigenin, a flavonoid present in chamomile, exerted a significant effect on DNA synthesis in

estrogen-dependent and estrogen-independent human breast cancer cells (Wang et al, 1997). Further studies are necessary to clarify the possible cancer preventative effects of these chemical components.

Antispasmodic Action in the Gastrointestinal Tract

Studies have shown the antispasmodic action of chamomile on the gastrointestinal tract. In one study, infant colic was significantly reduced when chamomile tea was given to 69 infants with colic symptoms (Weizman et al, 1993). However, this was a study of short duration (7 days).

Other Actions

Chamomile has shown an inhibitory effect against *Arcobacter butzleri, A. cryaerophilus, A. skirrowii* (Cervenka, et al, 2006); methanol extracts showed strong antimicrobial activity.

Product Availability

Capsules: 360 mg; cream; fluid extract; lotion; shampoo and conditioner; tea; tincture; various cosmetics

Plant Part Used: Dried flowers

Dosages

- Adult PO capsules: 300-400 mg, standardized to 1% apigenin and 0.5% essential oil, as often as 6 times/day (Foster, 1998)
- Adult PO fluid extract: 1-2 ml tid (1:1, 45% ethanol) (Smith, 1999)
- Adult PO tea: 2-4 oz prn (Moore, 1996)
- Adult PO tincture: 3-10 ml tid (1:5, 45% ethanol) (Bradley, 1992)
- Adult topical: 1½ cups water mixed with 2 tsp dried flowers, cover, let stand 10-15 min, strain, apply as a compress
- Child PO tea: ½-4 cups daily (Romm, 2000)
- Child PO tincture: ¼-1 tsp as often as qid (Romm, 2000)
- Child topical: as a wash or cream, apply prn to treat inflammation (Romm, 2000)

Contraindications

German chamomile: Pregnancy category is 1; breastfeeding category is 2A.
German chamomile *(Matricaria chamomilla)* may be given to children. Roman chamomile *(Chamaemelum nobile)* is a known abortifacient and should not be used during pregnancy and breastfeeding, but it may be given to children. Persons with asthma should not use this herb. Cross-hypersensitivity may result from allergy to sunflowers, ragweed, or members of the aster family (echinacea, feverfew, milk thistle).

Side Effects/Adverse Reactions

EENT: Burning of the face, eyes, mucous membranes (topical)
SYST: Hypersensitivity

Interactions

Drug

Alcohol: Chamomile may increase the effects of alcohol (theoretical).
Anticoagulants: Chamomile *(C. nobile)* may interfere with the actions of anticoagulants; avoid concurrent use.
CNS depressants: Chamomile may increase the effects of other sedatives; avoid concurrent use (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Flavonoid	Apigenin	Anxiolytic/phytoestrogen; antiinflammatory
	Glucoside; Chamaemeloside	Hypoglycemia
	Luteolin	Antiinflammatory
Volatile oil	Chamazulene	Antiallergy; antioxidant
	Bisabolol; Bisabololosides A, B; Azulenes	Antiinflammatory; antispasmodic
Acid	Angelic acid; Tiglic acid	
Farnesol		
Nerolidol		
Germacranolide		
Alcohol	Amyl alcohol; Isobutyl alcohol	
Coumarin		
Glycoside		
Heniarin		
Umbelliferone		
Fatty acid		

Client Considerations

Assess

- Determine whether the client is using chamomile for insomnia.
- Assess the client's sleeping patterns: ability to fall asleep and stay asleep, hours of sleep.
- Assess for the use of alcohol, anticoagulants, and sedatives (see Interactions).

Administer

- Instruct the client to store chamomile in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use *C. nobile* during pregnancy; it is a known abortifacient.
- Instruct the client to avoid using chamomile concurrently with other sedatives or alcohol; chamomile may increase their effects.

Chaparral

(sha-puh-rehl')

Scientific names: *Larrea tridentata, Larrea divaricata*

Other common names: Creosote bush, greasewood, *Hediondilla*

Origin: Chaparral is a shrub found in Mexico and the southwestern region of the United States.

Uses

Chaparral has traditionally been used to treat bronchitis, fever, joint inflammation, cancer, and diabetes. Chaparral is also used to treat chickenpox and snakebites and as a mouthwash to prevent tooth decay (Jellin et al, 2008).

Investigational Uses

Studies are underway to determine the efficacy of chaparral as an antitumor agent, an antimicrobial (Verastegui et al, 1996), and an anti-HIV-1 agent (Gnabre et al, 1996).

Actions

Hypoglycemic Action

One study evaluated the glucose-lowering ability of chaparral in mice with type 2 diabetes. Blood glucose decreased significantly, a finding that suggests the need for further study of the hypoglycemic effect of this herb (Luo et al, 1998). It is a well-documented fact that the Pima Indians have treated diabetes with chaparral for centuries.

Antitumor Action

Chaparral may represent a new class of HIV-responsive agents with clinical significance. Lignans isolated from chaparral have shown anti–HIV-1 activity (Gnabre, 1997). Factors used to evaluate tumors were survival time and the percentages of tumors that decreased in size, remained static, or increased in size. Results showed that the antitumor effects were better in vivo (Anesini et al, 1998). Previous studies demonstrated the antiproliferative activity of chaparral on T lymphoma cells in culture (Anesini et al, 1996).

Other Actions

One study (Verastegui et al, 1996) showed good antimicrobial activity against growth of yeasts, molds, and bacteria. More research needs to be completed to confirm these results. Another study (Gnabre et al, 1996) showed anti–HIV-1 activity. This activity may be due to two tricyclic ligans. The tannins in chaparral may be responsible for its antifungal action (Treviño-Cueto et al, 2007). Chaparral may be useful in the treatment of gallstone disease. In a lab experiment using hamsters with gallstones, concentrations up to 40-mg/dl were able to remove the gallstones (Arteaga et al, 2005).

Product Availability

Capsules, tablets, tea, tincture

Plant Part Used: Leaves

Dosages

- Adult PO capsules: 2-4/day (Moore, 1996)
- Adult PO tincture: 1-3 ml (1:5 dilution) tid (Moore, 1996)
- Adult topical: apply strong decoction tid (Moore, 1996)

Contraindications

Pregnancy category is 5; breastfeeding category is 5A.

Until more research is available, chaparral should not be given to children. Persons with hepatic or renal disease should avoid the use of this herb. The American Herbal Product Association has recommended that chaparral products not be sold until the hepatotoxicity question has been answered.

Continued

Side Effects/Adverse Reactions

GI: *Hepatotoxicity* (Sheikh et al, 1997; Stickel et al, 2000), *hepatic failure*

INTEG: Contact dermatitis

Interactions

Drug

Anticoagulants, antiplatelets, salicylates: Chaparral may increase the action of these products.

MAOIs: Chaparral may decrease the effect of MAOIs.

Lab Test

ALT, AST, total bilirubin, urine bilirubin: Chaparral may increase ALT, AST, total bilirubin, and urine bilirubin.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Phenolic compound	Nordihydroguaiaretic acid	Hepatotoxicity, antiinflammatory, platelet inhibitor
Lignans	Dihydroguaiaretic acid; Nor-Isoguaiasin	Anti-HIV, antioxidant (Vassão et al, 2007)
Tannins (Treviño-Cueto et al, 2007)		Antifungal

Client Considerations

Assess

- Assess the reason the client is using chaparral medicinally.
- Assess for hepatotoxicity (increasing AST and ALT test results, clay-colored stools, right upper-quadrant pain). If symptoms are present, use of this herb should be discontinued immediately.
- Assess for contact dermatitis. If it is present, use of this herb should be discontinued.

Administer

- Instruct the client to store chaparral away from moisture and sunlight.

Teach Client/Family

- Inform the client that pregnancy category is 5 and breastfeeding category is 5A.
- Advise the client not to give chaparral to children until more research is available.
- Advise the client to avoid chaparral because it can cause serious hepatic damage. The FDA considers chaparral an unsafe herb.

= Pregnancy = Pediatric = Alert = Popular Herb

Chaste Tree

(chayst tree)

Scientific name: *Vitex agnus castus*

Other common names: Chasteberry, gatillier, hemp tree, keuschbaum, monk's pepper

Origin: Chaste tree is a shrub found in the Mediterranean and Europe.

Uses

Chaste tree is used to treat premenstrual syndrome symptoms, dysmenorrhea, menstrual irregularities, mastodynia, uterine bleeding, impotence, spermatorrhea, prostatitis, and infertility in women. Chaste tree may also be used to increase lactation. *Vitex* is thought to enhance the natural production of progesterone and luteinizing hormone and diminish the release of follicle-stimulating hormone.

Actions

Scientific studies to support any of the uses for or actions of chaste tree are lacking.

Antiprolactin Secretion

The few studies that have been published focus on the hypoprolactinemic effect of chaste tree. In concentrations of 3.3 mg/ml, the extract significantly inhibited thyrotropin-releasing hormone–stimulated prolactin release (Jarry et al, 1991). Another study confirms the inhibition of prolactin secretion (Sliutz et al, 1993). These studies suggest that chaste tree may produce beneficial effects in all conditions that relate to luteal phase defects.

Premenstrual Syndrome Action

One study using the premenstrual tension syndrome (PMTS) scale has shown that chaste tree significantly reduces premenstrual syndrome symptoms. Participants reported decreased incidence of breast tenderness, headache, constipation, edema, and tension (Lauritzen, 1997). Two other studies confirm the results of the 1997 study (Berger et al, 2000; Loch et al, 2000).

Other Actions

Dopaminergic action via opioid receptors was identified (Meier et al, 2000). This is the first study suggesting this action.

Product Availability

Aqueous-alcoholic extract, capsules, fluid extract, powder, solid extract, tea, tincture

Plant Part Used: Ripe, dried fruit

Dosages

Impotence

- Adult PO extract: 350-500 mg daily (Murray, Pizzorno, 1998)

Menopause

- Adult PO dry powdered extract: 250-500 mg tid (4:1 dilution) (Murray, Pizzorno, 1998)
- Adult PO fluid extract: 4 ml (1 tsp) tid (1:1 dilution) (Murray, Pizzorno, 1998)
- Adult PO powdered berries or tea: 1-2 g tid (Murray, Pizzorno, 1998)

Premenstrual Syndrome

- Adult PO fluid extract: 2 ml (Murray, Pizzorno, 1998)

- Adult PO dry powdered extract: 175-225 mg (0.5% agnuside content) (Murray, Pizzorno, 1998)

Other

- Adult PO capsules: 20 mg daily
- Adult PO fluid extract: 30-40 mg daily (Blumenthal, 1998)
- Adult PO tincture: 1-2 ml bid-tid (Smith, 1999)

Contraindications

Pregnancy category is 2; breastfeeding category is 2A.
Until more research is completed, chaste tree should not be given to children.

Side Effects/Adverse Reactions

CNS: Headache
GI: Diarrhea, abdominal cramps, anorexia
INTEG: Rash, itching

Interactions

Drug

Antipsychotics: Chaste tree may interfere with the antipsychotic action (theoretical) (Jellin et al, 2008).
Beta-blockers: Chaste tree may lead to hypertensive crisis.
Dopamine agonists *(levodopa, parlodel, pramipexole, ropinirole):* Chaste tree may increase the action of dopamine agonists (theoretical) (Jellin et al, 2008).
Estrogens, hormonal contraceptives: Chaste tree may interfere with the action; avoid concurrent use.

Lab Test

Serum prolactin: Chaste tree may decrease serum prolactin

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Essential oil	Sesquiterpenoids; Alpha-pinene; Beta-pinene; Castine; Eucalyptol; Limonene; Cineole	
Flavonoid		
Iridoid glycoside	Agnuside, Aucubin	
Progesterone		Hormonal
Hydroxyprogesterone		Hormonal
Testosterone		Hormonal

Client Considerations

Assess

- Determine the condition for which the client is using chaste tree.
- Assess for menstrual irregularities and whether the client is using chaste tree to treat conditions such as premenstrual syndrome, uterine bleeding, or increased

menstrual flow. Discontinue use of herb if nausea, diarrhea, or abnormal changes in menses occurs (Smith, 1999).

- Assess for increasing depression to suicidal proportions as a result of estrogen deficiency.

Administer

- Instruct the client to store chaste tree in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 2 and breastfeeding category is 2A.
- Advise the client not to give chaste tree to children until more research is available.
- Inform the client that few scientific studies confirm any of the claims made for chaste tree.
- Advise the client to notify the prescriber immediately if depression occurs.

Chaulmoogra Oil

(chawl-mew'gruh)

Scientific names: *Hydnocarpus wightiana, Hydnocarpus anthelmintica, Taraktogenos kurzii*

Other common names: Gynocardia oil, hydnocarpus oil, krabao's tree seed

Origin: Chaulmoogra oil is found in India and China.

Uses

In traditional herbal medicine, chaulmoogra oil (in an injectable, subcutaneous form) has been used to treat leprosy, eczema, and psoriasis. Traditional Chinese medicine practitioners use the seeds in a decoction for external use only to treat scabies, trichomoniasis, tinea, and yeast infections *(Hydnocarpus da fengzi)*.

Investigational Uses

Beginning research shows positive results using *Hydnocarpus* oil to treat wounds in leprosy (Oommen et al, 1999).

Actions

Antileprotic Action

Several research studies have confirmed the efficacy of chaulmoogra oil against *Mycobacterium leprae* (Levy, 1975; Noordeen, 1991). However, many more effective treatments are available via traditional pharmacology. Since the 1940s, practitioners in developed countries have rarely used chaulmoogra oil to treat leprosy. Another study (Oommen et al, 1999) showed more positive wound healing than with traditional chemotherapeutic agents for leprosy. The rats tested showed an increase in weight and strength of scar tissue.

Product Availability

Oil, injectable (subcutaneous); oil, topical

Plant Part Used: Seeds

Dosages

- Adult subcutaneous oil: 15 ml injected twice weekly until remission.

No typical doses (Jellin et al, 2008)

Contraindications

Until more research is available, chaulmoogra oil should not be used during pregnancy and breastfeeding. It should not be given to children.

Side Effects/Adverse Reactions

GI: Gastrointestinal upset, irritation (subcutaneous)
INTEG: Precipitation under skin (subcutaneous), pain at injection site

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Cyanogenic glycoside		
Fatty acid	Palmitic acid; Oleic acid	
Acid	Chaulmoogric acid (Hypnocarpic acid)	
	Gorlic acid	
Flavolignan		
Protein		
Phytosterols		

Client Considerations

Assess

- Assess for eczema and psoriasis before and after treatment with this product.
- Determine whether the client is using chaulmoogra oil to treat possible leprosy. Inform the client that safer, better-tested treatments exist.

Administer

- Instruct the client to store chaulmoogra oil in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use chaulmoogra oil in children or those who are pregnant or breastfeeding until more research is available.
- Inform the client that mainstream medications are more effective than chaulmoogra oil for the treatment of leprosy.
- Advise the client that only an experienced health care provider should diagnose leprosy.

Chickweed ◆

(chik′weed)

Scientific name: *Stellaria media*

Other common names: Mouse-ear, satinflower, star chickweed, starweed, stitchwort, tongue grass, white bird's eye, winterweed

Origin: Chickweed is an annual found in Europe and North America.

Uses

Chickweed is used internally as an antitussive, an expectorant, a demulcent, and as a treatment for sore throat, peptic ulcer, gastroesophageal reflux disease, and dyspepsia. Externally, chickweed is used to treat boils, abscesses, burns, rashes, psoriasis, eczema, pruritus, and insect bites and also promotes wound healing. Chickweed is also eaten as a food in salads (Jellin et al, 2008).

Investigational Uses

Chickweed may be useful as an antihepatoma agent (Lin et al, 2002) and an antioxidant (Pieroni et al, 2002).

Actions

Scientific studies of the medicinal uses of chickweed are lacking. Human cases of nitrate toxicity and paralysis have been reported. The available literature supports the use of chickweed as a weed killer.

Other Actions

Antioxidant activity was identified. Twenty-seven extracts of weedy vegetables were tested for antioxidant effect. *Stellaria media* along with two other herbs showed strong in vitro inhibition of xanthine oxidase (Pieroni et al, 2002). The antioxidant action may be due to rutin, a flavonoid. Fifteen crude drugs including *Stellaria media* were tested for in vitro antihepatoma activity on five human hepatic cancer cell lines. *Stellaria media* was not as effective as *Coptis groenlandica* (Lin et al, 2002).

Product Availability

Capsules, crude herb, fluid extract, oil, ointment, tea, tincture

Plant Parts Used: Flowers, leaves, stems

Dosages

Skin Conditions

- Adult topical ointment: apply prn
- Adult topical poultice: apply prn

Other

- Adult PO capsules: 3 capsules tid
- Adult PO fluid extract: 15-30 drops diluted, as often as tid
- Adult PO tea: take qid prn
- Adult PO tincture: take prn

Contraindications

Pregnancy category is 3; breastfeeding category is 2A.

Until more research is available, chickweed should not be given to children (no data available). High doses of chickweed can be toxic (Duke, 2003).

Side Effects/Adverse Reactions

CNS: Headache, dizziness

SYST: *Nitrate toxicity, paralysis (high doses)*

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Saponin		Nitrate toxicity
Vitamin	A; B complex; C (375 mg/100 g)	
Coumarin		
Hydroxycoumarin		
Flavonoid	Rutin	Antioxidant
Nitrate salt		
Mineral	Calcium Iron	

Client Considerations

Assess

- Assess for toxicity.
- Determine the reason the client is using chickweed.

Administer

- Inform the client that because of the potential for nitrate toxicity, only qualified herbalists should administer this herb (Duke, 2003).

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 2A.
- Advise the client not to give chickweed to children (no data available).
- Instruct the client not to use this herb unless under the supervision of a qualified herbalist. No scientific studies exist to document any of its actions or uses. Nitrate toxicity and paralysis can occur.

Chicory

(chik'o-ree)

Scientific name: *Cichorium intybus*

Other common names: Blue sailors, garden endive, succory, wild succory

Origin: Chicory is a perennial found in Egypt, India, and the United States.

Uses

Chicory is used as a diuretic and laxative, a coffee substitute, a sedative, an appetite stimulant, and a treatment for cancer. It can be found in many tea product formulas. Chicory is a very mild herb used for its bitter properties, mostly as a tonic.

Actions

Very few studies are available for chicory. This herb is thought to possess sedative, laxative, and antiarrhythmic properties, but no studies have proven any of these claims.

Hepatoprotective Action

One of the chemical components of chicory, esculetin (a phenolic coumarin), has been found to exert hepatoprotective effects (Zafar et al, 1998). In one study, rats were given paracetamol, a chemical that causes hepatic damage, followed by esculetin. Esculetin reduced mortality rates and prevented a rise in hepatic function enzymes (Gilani et al, 1998).

Other Actions

Mast cell–mediated allergic reactions were inhibited in vivo and in vitro by *Cichorium intybus* (Kim et al, 1999). The nonalkaloid acetylcholinesterase inhibitors from chicory have shown promise for use in severe dementia and Alzheimer's disease (Rollinger et al, 2005).

Product Availability

Crude herb, extract, root (roasted and raw)

Plant Parts Used: Leaves, roots

Dosages

- Adult PO crude herb: 3 g daily (Blumenthal, 1998) (NOTE: Dosages vary widely)
- Adult PO decoction: 3-6 oz prn
- Adult PO tea: 2-4 g of the root in 150 ml boiling water for 10 min, strain (Jellin et al, 2008)

Contraindications

Class 1 herb.

Chicory should not be used during pregnancy and breastfeeding and should not be given to children. Persons who have cardiovascular disease or are hypersensitive to chicory or asteraceae/compositae herbs should avoid its use. Persons with gallstones should use chicory only under the supervision of an herbalist.

Side Effects/Adverse Reactions

INTEG: Contact dermatitis, other allergic skin rashes

Interactions

Drug

Cardioactive products: Chicory may increase the effect of these products.

Lab Test

PT, INR: Chicory may alter the results of these tests.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Guaianolides (Kisiel et al, 2001)		
Polysaccharide	Inulin	Increased probiotic, antiarrhythmic
	Lactucin; Lactucopicrin	
Chicoric acid		Sedative
Glycoside		

Continued

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Carbohydrate		
Sterol		
Triterpenoid		
Lactone		
Tartaric acid		
Acetophenone		Aromatic
Phenolic coumarin	Esculetin	Hepatoprotective
Flowers:	Delphinidin (Norbaek et al, 2002)	
Anthocyanins		

Client Considerations

Assess

- Assess the reason the client is using chicory medicinally.
- Assess for allergic reactions (rash, itching, contact dermatitis); discontinue use if any of these symptoms are present and administer antihistamine or other appropriate therapy.

Administer

- Instruct the client to store chicory away from moisture and light.

Teach Client/Family

- Caution the client not to use chicory in children or those who are pregnant or breastfeeding.
- Advise clients with cardiovascular disease not to use chicory.
- Advise clients with gallstones to use this herb only with caution and under the supervision of a qualified herbalist.

Chinese Cucumber

(chy-neez′ kyew′kuhm-buhr)

Scientific name: *Trichosanthes kirilowii*

Other common names: Chinese snake gourd, gua-lou, tia-hua-fen

Origin: Chinese cucumber is a member of the gourd family found in China.

Uses

Chinese cucumber is used to treat HIV/AIDS, cancer, inflammation, ulcers, and diabetes. It is also used to induce abortion. Not a commonly used herb, gua lou ren (the seed) is primarily used in traditional Chinese medicine as a respiratory sedative, demulcent, and expectorant.

Actions

Uterine Stimulation

Trichokirin inhibits protein synthesis and also acts as an abortifacient. This action is believed to be mediated by the ribosome inactivation (Nie et al, 1998).

Antitumor Action

Trichokirin has exhibited anti-HIV activity (Nie et al, 1998). The antitumor action may be due to modulation of programmed cell death and arrested proliferation. Other medicinal plants with this action are soy, garlic, ginger, and green tea (Thatte et al, 2000). Another study (Akihisa et al, 2001) identified compounds from the seeds of *Trichosanthes kirilowii*. The compounds tested showed inhibition of Epstein-Barr virus, early antigen (EBV-EA).

Product Availability

Juice

Plant Parts Used: Fruit, rind of fruit, seed

Dosages

- Adult: dosages are not clearly delineated in the literature. Chinese cucumber juice is used to induce abortion.

Contraindications

Class 1 herb.

Because Chinese cucumber is a powerful abortifacient, it should not be used during pregnancy. Until more research is available, this herb should not be used during breastfeeding. It should not be given to children. Persons with seizure disorders or diarrhea should not use this herb.

Side Effects/Adverse Reactions

CNS: Fever, *seizures*
GI: Diarrhea, gastric upset (Jellin et al, 2008)
REPRODUCTION: *Abortion*
SYST: Hypersensitivity, *fluid in the lungs and brain, heart damage, death*

Interactions

Drug

Antidiabetics: Chinese cucumber may increase the effects of antidiabetics.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Trichobitacin		Anti–HIV-1, increase CD4 cells
Trichosanthin	Alpha-trichosanthin; Beta-trichosanthin	Abortifacient, cytotoxic
Trichokirin		Ribosome inactivator
Karasurin		Abortifacient
Sterol		Antiinflammatory
Palmitic acid		
Galactose		
Galactonic acid gamma-lactone		

Client Considerations

Assess

- Assess the reason the client is using Chinese cucumber medicinally.
- Assess for the presence of seizure disorders. If present, do not use Chinese cucumber.

Administer

- Chinese cucumber may be used by an herbalist to induce abortion by applying Chinese cucumber juice to a sponge and inserting into vagina. Under the supervision of a competent herbalist, this herb can be injected intramuscularly or extraamniotically to induce first-trimester abortions.

Teach Client/Family

- Caution the client not to use Chinese cucumber during pregnancy because it is an abortifacient.
- Caution the client not to use Chinese cucumber in children or those who are breastfeeding until more research is available.

Chinese Rhubarb

(chy-neez′ rew′bahrb)

Scientific name: *Rheum palmatum*

Other common names: Himalayan rhubarb, medicinal rhubarb, rhei radix, rhei rhizoma, rubarbo, Turkish rhubarb

Origin: Chinese rhubarb is a perennial found in China and Tibet.

Uses

Chinese rhubarb is used as a laxative and an antidiarrheal. It is commonly found in "neutralizing cordial" formulas today, which were also very popular from the 1800s through the 1940s. Short-term use is recommended. Chinese rhubarb may be used as part of a detoxifying regimen. This herb is not the same as garden rhubarb.

Actions

Laxative and Antidiarrheal Actions

The laxative action of anthranoids is well documented in the mainstream pharmacologic literature. This action is a result of direct chemical irritation of the colon, which increases the propulsion of the stool through the bowel. The anthraquinones possess purgative properties, and the tannins and bitters possess antidiarrheal properties. Small doses have a tightening, drying effect; larger doses cause a laxative or purgative effect (Weiss, 1988; Yim et al, 1999).

Renal Action

In one study in which Chinese rhubarb was combined with an angiotensin-converting enzyme (ACE) inhibitor and captopril, an antiarrhythmic, renal failure was slowed. The use of the herb together with the two drugs produced much better results than did either the drugs or the herb alone (Zhang, 1990). Another study (Song et al, 2000) identified decreasing urinary interleukin 6 (IL-6) and lowered immune inflammation after *Rheum palmatum* was given. Determination of urinary IL-6 level is useful in studying the severity of immune inflammation of chronic renal failure.

Product Availability

Extract, powder, syrup, tablets, tincture

Plant Parts Used: Bark, dried root, dried underground parts

Dosages

Diarrhea

- Adult PO decoction or tincture: 1 tsp daily
- Adult PO neutralizing cordial: 1-4 ml, dilute in water, q½-2 hr according to urgency of symptoms (Smith, 1999)

Gastrointestinal Bleeding

- Adult PO powder or tablets: 3 g bid-qid

Laxative

- Adult PO decoction: 1-2 tsp daily; may be taken with evening meal
- Adult PO tincture: ½-1 tsp daily; may be taken with evening meal

Contraindications

Class 2b/2c/2d herb.

Until more research is available, Chinese rhubarb should not be used by persons with hypersensitivity to this herb or by pregnant and breastfeeding women. It should not be given to children. Chinese rhubarb should not be used by persons with gastrointestinal bleeding or obstruction, abdominal pain, nausea, vomiting, appendicitis, or Crohn's disease. Use of this herb should be short term, unless under the supervision of a qualified herbalist.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, diarrhea, abdominal cramps, laxative dependency
GU: Urine discoloration, hematuria, albuminuria (high doses, long term use)
SYST: Vitamin and mineral deficiencies, fluid and electrolyte imbalances (high doses, long term use)

Interactions

Drug

Antacids: Antacids may decrease the effectiveness of Chinese rhubarb if taken within 1 hour of the herb.
Antiarrhythmics, cardiac glycosides, corticosteroids: Chronic use of Chinese rhubarb can cause hypokalemia and enhance the effects of antiarrhythmics, cardiac glycosides, corticosteroids.
Thiazide diuretics: Chronic use of Chinese rhubarb can cause hypokalemia and enhance the effects of thiazide diuretics; avoid concurrent use.

Herb

Jimsonweed: The action of jimsonweed is increased in cases of chronic use or abuse of Chinese rhubarb.
Licorice root: Hypokalemia can result from the use of Chinese rhubarb with licorice root; avoid concurrent use.

Food

Milk: The effectiveness of Chinese rhubarb may be decreased when taken concurrently with milk.

Lab Test

Potassium level: Chinese rhubarb may decrease potassium levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Anthraquinones	Rhein; Senosides (A, B, C), Aloe-emodin (Wang et al, 2008)	Laxative Decreased mitochondrial activity, energy production
	Chrysophanol; Aloe emodin	
Tannins	Gallo	Wound healing; antiinflammatory
	Galloy-1-glucose; Galloy-1-saccharose; Lindleyine; Isolindleyine	
Stilbene		
Phenolic	Glucogallin; Gallic acid; Catechin	
Polyketide synthase	Benzalacetone synthase	

Client Considerations

Assess

- Assess the reason the client is using Chinese rhubarb medicinally.
- Assess blood and urine electrolytes if the client uses this herb often.
- Determine the cause of constipation, identifying whether bulk, fluids, or exercise is missing from the client's lifestyle.
- Assess for cramping, nausea, and vomiting; if these symptoms occur, discontinue use of this herb.
- Assess for medications used (see Interactions).

Administer

- Instruct the client to take Chinese rhubarb with other herbs to prevent griping. For best absorption, this herb should not be taken within 1 hour of other drugs, antacids, or milk.

Teach Client/Family

- Caution the client not to use Chinese rhubarb in children or those who are pregnant or breastfeeding until more research is available.
- Caution the client to avoid long-term use of this herb, which can cause loss of bowel tone.
- Instruct the client to notify the provider if Chinese rhubarb does not relieve constipation or if symptoms of electrolyte imbalance occur (muscle cramps, pain, weakness, dizziness).

Chitosan

(kie'tuh-san)

Scientific name: N/A

Other common names: Chitosan ascorbate, deacetylated chitin, *N*-acetylchitosan

Origin: Chitosan comes from the shell of marine crustaceans.

Uses

Chitosan is used orally for weight loss, to control blood pressure, and to decrease cholesterol. Topically it is used for periodontitis and tissue healing.

Investigational Uses

New studies are underway for chitosan's use in chronic renal failure, as a hemostatic, for drug delivery systems, and for assistance in nerve regeneration.

Actions

Weight Loss Action

One study using 50 obese women studied the effects of chitosan on body weight (Zahorska et al, 2002). Significantly more weight was lost in the chitosan group. Another study (Kobayashi et al, 2002) had results that were similar. Fat deposition and lipase activity decreased significantly in chickens when chitosan was added to the diet. In a review of 14 studies with over 1100 participants, it was shown that there was a placebo control group. Those taking chitosan lost about 3.7 extra pounds and improved their blood pressure and cholesterol (Hitti, 2005). However, in trials over 4 wk the weight loss was variable.

Other Actions

Chitosan is able to absorb protein and adhere to nerve cells, promoting nerve regeneration (Yang et al, 2001).

Product Availability

Powder, tablets

Plant Parts Used: N/A

Dosage

- Adult PO: take for 2-3 days
- Adult topical: apply to stop bleeding or for assistance in nerve regeneration.

Renal Failure with Hemodialysis

- Adult PO: 1.35 g tid (Jellin et al, 2008)

Contraindications

Chitosan should not be given to children or those who are pregnant, breastfeeding, have osteoporosis or Paget's disease, or who are hypersensitive to shellfish.

Side Effects/Adverse Reactions

CV: Hypotension

GI: Constipation, flatulence, steatorrhea, weight loss

Interactions

Drug

Fat-soluble vitamins or minerals: Chitosan may decrease the absorption of fat-soluble vitamins or minerals; separate by 2 hours or more.

Client Considerations

Assess

- Assess the reason the client is using chitosan.
- Assess the gastrointestinal system for constipation, flatulence, steatorrhea; if severe, chitosan may need to be discontinued.

Administer

- Keep chitosan in a dry area, away from excessive heat or moisture.

Teach Client/Family

- Advise the client not to use chitosan in children or those who are pregnant or breastfeeding until more research is available.

Chondroitin

(kahn-droe′uh-tuhn)

Scientific names: Chondroitin sulfate, chondroitin sulfuric acid, chonsurid

Other common names: CAS, Chondroitin Sulfate, Chondroitin C

Origin: Chondroitin is obtained from bovine tracheal cartilage.

Uses

Chondroitin is used alone or in combination with glucosamine to treat joint conditions such as arthritis. It is also used as an antithrombotic, an extravasation therapy agent, and as a treatment for ischemic heart disease and hyperlipidemia.

Actions

Antiarthritic Action

Chondroitin attracts essential fluid into the joints, which acts as a shock absorber. It also attracts needed nutrients into cartilage (Benedikt, 1997). Research findings continue to conflict regarding the beneficial effects of chondroitin. It may protect cartilage from degradation. An NIH study on chondroitin that included 1583 people with knee pain showed no benefit in patients with mild knee osteoarthritis (Brett, 2008). Another review found the preservation of joint-space within the osteoarthritic knee had no change in symptoms (Kelly, 2005; Bruyere et al, 2008).

Extravasation Action

Chondroitin has been used to treat extravasation after ifosfamide therapy. One study demonstrated its ability to decrease pain and inflammation (Mateu et al, 1996). The same study also used chondroitin after vindesine therapy and showed that it relieved extravasation (Mateu et al, 1996). Similar results were obtained using chondroitin after doxorubicin therapy and vincristine therapy (Comas et al, 1996).

Antithrombolytic Action

Because of its ability to inhibit thrombi (Lane et al, 1992), chondroitin is used as an anticoagulant in hemodialysis.

Product Availability

Capsules: 200, 400 mg; source: cartilage of the bovine trachea

Dosages

- Adult PO weight <120 pounds: 1000 mg glucosamine and 800 mg chondroitin
- Adult PO weight 120-200 pounds: 1500 mg glucosamine and 1200 mg chondroitin
- Adult PO weight >200 pounds: 2000 mg glucosamine and 1600 mg chondroitin (Theodosakis, 1997)

Contraindications

Until more research is available, chondroitin should not be used during pregnancy and breastfeeding. It should not be given to children. Chondroitin should not be used by persons with bleeding disorders, asthma, prostate cancer, or renal failure.

Side Effects/Adverse Reactions

CNS: Headache, restlessness, euphoria
GI: Nausea, vomiting, anorexia
SYST: Bleeding

Interactions

Drug

Anticoagulants, NSAIDs, salicylates: Chondroitin used with anticoagulants, NSAIDs, or salicylates can cause increased bleeding; do not use chondroitin at high doses.

Lab Test

Anti-factor Xa: May be increased when used with chondroitin (Jellin et al, 2008).
Prothrombin time: May be increased when used with high dose of chondroitin and glucosamine (Jellin et al, 2008).

Pharmacology

Pharmacokinetics

Very little is known about the pharmacokinetics. The half-life of this herb is extended when used by persons with renal failure.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Mucopolysaccharide Glycosaminoglycan (GAC) Lyases	Chondroitinase AC, B	Antitumor

Client Considerations

Assess

- Assess the reason the client is using chondroitin.
- Assess for joint conditions: joints involved; aggravating and ameliorating factors; and pain location, intensity, and duration.
- Assess for other medications used; chondroitin should not be used concurrently with anticoagulants, NSAIDs, or salicylates because of the risk of increased bleeding.

Administer

- Instruct the client to store chondroitin in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use chondroitin in children or those who are pregnant or breastfeeding until more research is available.

Chromium

(krow'mee-uhm)

Other common names: Chromium picolinate, chromium polynicotinate, chromium chloride

Origin: Chromium is available from dietary sources such as brewers yeast, molasses, brown sugar, coffee, tea, and some wines and beers.

Uses

Chromium is an essential trace mineral that is required for proper metabolic functioning. It may be helpful in the treatment of decreased glucose tolerance, arteriosclerosis, elevated cholesterol, glaucoma, hypoglycemia, diabetes, and obesity.

Actions

Nutritional trivalent chromium (Cr^{+3}) is different from industrial hexavalent chromium (Cr^{+6}), which is extremely toxic. Industrial hexavalent chromium is responsible for serious pulmonary disorders and cancer in exposed workers. The population as a whole is believed to be deficient in nutritional chromium because even well-balanced diets fall short of providing the needed chromium levels (Anderson, 1985).

Improved Glucose Tolerance

Since the 1950s, at least 15 well-controlled studies have been conducted on the use of chromium to improve glucose tolerance. Chromium has been shown to increase the number of insulin receptors in peripheral tissues; to increase the binding of the insulin to receptors; to decrease tyrosine phosphatase; to terminate the receptor response; and to decrease fasting glucose, serum lipids, and HbA_{1c} levels. Chromium may also increase HDL cholesterol (Anderson, 1998). Most of the studies showing positive results have occurred in type 2 diabetes mellitus, maturity-onset. Althuisa et al (2002) studied glucose and insulin responses to dietary chromium supplement. No changes in glucose or insulin responses were found in nondiabetic subjects. In two journal articles (Boggs, 2007; Barclay, 2005) evidence was presented that chromium may not improve glycemic control in type 2 diabetes.

Other Actions

Preliminary information on the ability of chromium to decrease obesity is available. Because a lack of chromium increases the percentage of body fat, supplementation in those who lack the required levels may help them lose weight. Chromium supplementation has been shown to increase muscle mass and decrease body fat (Kaats et al, 1998). Because the chromium excretion of athletes is increased, supplementation may be necessary. However, evidence supporting the need for supplementation to

improve athletic performance is lacking (Clarkson, 1997). Another action may be the antithrombotic mechanism of chromium. Chromium was identified as preventing experimental venous thrombosis (Pacheco et al, 2000).

Product Availability

Capsules

Dosages

- Adult PO: 50-200 mcg/day (Food and Nutritional Board, 1989)
- Adult PO: 200-600 mcg/day (La Valle et al, 2001)
- Child PO: 0-0.5 yr: 10-40 mcg/day
- Child PO: 0.5-1 yr: 20-60 mcg/day
- Child PO: 1-3 yr: 20-80 mcg/day
- Child PO: 4-6 yr: 30-120 mcg/day
- Child PO: 7 yr and older: 50-200 mcg/day

Contraindications

Until more research is available, chromium should be given to children and used during pregnancy and breastfeeding only in the recommended dosages listed.

Side Effects/Adverse Reactions

CNS: Headache, insomnia, mood change, restlessness, irritability
HEMA: High doses: *anemia, thrombocytopenia, hemolysis*
MISC: High doses: *renal failure, hepatic dysfunction*

Interactions

Drug

Antacids *(calcium carbonate)*, ***calcium supplements:*** Calcium products reduce the absorption of chromium; separate by ≥2 hr.
Antidiabetics *(acarbose, acetohexamide, chlorpropamide, glimeperide, glipizide, insulin, metformin, miglitol, pioglitazone, tolazamide, tolbutamide, troglitazone):* Chromium may reduce the action of antidiabetics.
Ascorbic acid: An increase occurs in both chromium and ascorbic acid absorption when taken together.
Iron, zinc: Absorption of chromium is decreased when taken with iron, zinc.

Food

Complex carbohydrates: Absorption of chromium is increased when taken with complex carbohydrates.

Lab Test

Blood glucose: Chromium decreases test values.
HDL levels: Chromium may increase levels.
Triglycerides: Chromium may decrease levels (Jellin et al, 2008).

Pharmacology

Pharmacokinetics

Absorption of chromium is minimal at 1% to 2% of supplement. Chromium is bound by transferrin and albumin and is transported through the circulatory system, where it is converted to an organic form and stored in tissues. Excess chromium is excreted via the kidneys.

Client Considerations

Assess

- Assess for symptoms of chromium deficiency (fasting hyperglycemia, decreased lean body mass, increased body fat, increased intraocular pressure).
- Assess for possible conditions related to chromium deficiency: stress, trauma, extreme exercise, pregnancy, infection.
- Assess for the use of ascorbic acid, iron, and zinc (see Interactions).

Administer

- Instruct the client to store chromium in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to exceed recommended dosages for children or those who are pregnant or breastfeeding until more research is available.
- Instruct the client not to take chromium supplements with zinc or iron supplements; these two minerals decrease the absorption of chromium.
- Inform the client of ways to increase chromium in the diet: brewers yeast, molasses, brown sugar, coffee, tea, and some wines and beers.

Cinnamon

(si'nuh-muhn)

Scientific name: *Cinnamomum* spp.

Other common names: *Cassia, Cassia lignea,* Ceylon cinnamon, Chinese cinnamon, cinnamomom, false cinnamon, Padang cassia, Panang cinnamon, Saigon cassia, Saigon cinnamon

Origin: Cinnamon is found in India, South America, Sri Lanka, and the West Indies.

Uses

Cinnamon is used as an antifungal, analgesic, and antiseptic, and to treat diarrhea, the common cold, abdominal pain, hypertension, loss of appetite, and bronchitis. It is also used to treat passive internal bleeding, sometimes as an essential oil in combination with *Erigeron* essential oil. In contemporary use, cinnamon is rarely used alone. It is considered one of the major adjuvant herbs used in small amounts to assist in the assimilation of an herbal formula. Cinnamon is an aromatic and tends to be spicy, warming, and vasodilating, as well as cooling (see Actions).

Actions

Cinnamon is considered to be spicy, warming, and vasodilating due to the volatile oils. It is also considered to be drying and cooling due to the tannin content. This warming and cooling combination is especially effective for the treatment of diarrhea when there is griping. Cinnamon is often added to laxative formulas for this purpose. It is an aromatic stimulant, mainly to the gastrointestinal tract; a carminative; and an astringent. Cinnamon possesses marked hemostatic power and is used to flavor unpleasant-tasting medicines.

Antimicrobial/Antifungal Action

Cinnamon bark has been shown to be effective against the following organisms that cause respiratory tract infections: *Candida albicans, Candida tropicalis, Aspergillus niger, Aspergillus fuigatis, Aspergillus midulans, Aspergillus flavus, Histoplasma,* and *Cryptococcus neoformans* (Viollon et al, 1994). Cinnamon extract has shown an inhibitory effect on *Helicobacter pylori* (Tabek et al, 1999). *Arcobacter butzleri, A. cryaerophilus,* and *A. skirrowii* (Cervenka et al, 2006) methanol extracts showed strong antimicrobial activity.

Antidiabetic Action

The insulin-potentiating effect of cinnamon bark and its role in glucose metabolism have been studied (Khan et al, 1990, Verspohl et al, 2005; Pham et al, 2007). In a study in which streptozocin was administered long term to induce diabetes mellitus in rats, cinnamon bark conferred some protection against diabetic conditions when administered along with the streptozocin (Onderoglu et al, 1999).

Product Availability

Dried bark, essential oil, leaves, fluid extract, powder, tincture

Plant Parts Used: Bark, leaves

Dosages

Dosages vary widely

Passive Bleeding

- Adult PO essential oil: used in combination with *Erigeron* essential oil, diluted in a carrier oil such as vegetable oil; 10-30 drops (Smith, 1999)

Other

- Adult PO bark: 2-4 g daily (Blumenthal, 1998)
- Adult PO essential oil: 0.05-0.2 ml diluted in a carrier oil daily
- Adult PO infusion: 1 cup bid-tid at meals
- Adult PO fluid extract: 0.5-1 ml tid
- Adult PO tincture: 1-3 ml tid

Contraindications

Class 2b/2d herb.

Until more research is available, except as a spice or for flavoring, cinnamon should not be used during pregnancy and breastfeeding. It should not be given to children. Persons with hypersensitivity to cinnamon or balsam of Peru should not use cinnamon. Prolonged use is not recommended in persons with intestinal or gastric ulcers.

Side Effects/Adverse Reactions

CNS: Flushing
CV: Increased heart rate
EENT: Stomatitis, glossitis, gingivitis
GI: Increased motility, anorexia, irritant (full doses)
INTEG: Allergic dermatitis (topical) (Jellin et al, 2008).
RESP: Shortness of breath
SYST: Hypersensitivity

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil	Eugenol; Cinnamaldehyde	Antimicrobial; analgesic; antioxidant
	Weiterhin; Cinnamic acid	
O-glucoside		Gastrointestinal protectant
Diterpene		
Mucilage		
Cyclobutane lignan	Cinbalansan	
Coumarin		
Cinnamyl acetate		

Client Considerations

Assess

- Assess the reason the client is using cinnamon medicinally.
- Assess for hypersensitivity (rash, wheezing); if present, discontinue use of cinnamon and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store cinnamon in a cool, dry place, away from heat and moisture.
- Instruct the client to dilute cinnamon oil in a carrier oil.

Teach Client/Family

- Caution the client not to use cinnamon bark therapeutically in children or those who are pregnant or breastfeeding until more research is available.

Clary

(kla′ree)

Scientific names: *Salvia sclarea, Euphrasia officinalis* (eyebright)

Other common names: Clary oil, clary sage, clear eye, eyebright, muscatel sage, orvale, see bright, toute-bonne

Origin: Clary is a perennial found in Europe.

Uses

Clary is used as an antiinflammatory to decrease muscle and nervous tension; an antispasmodic; a sedative; an astringent; and as a treatment for menopausal symptoms, premenstrual syndrome, decreased libido, and fatigue. It is also used to stimulate the adrenals and, in Europe, as a remedy for sore throat.

Actions

Antimicrobial Action

Several chemical components of *Salvia sclarea* have been found to possess antimicrobial properties. The diterpenoids and sesquiterpenoids were tested for antimicrobial effects against bacteria and yeast. Dehydrosalvipisone, sclareol, manool, oxoroyleanone, spathulenol, and caryophyllene were found to be active against *Staphylococcus aureus.*

Dehydrosalvipisone and manool were found to be active against *Candida albicans,* and caryophyllene was found to be active against *Proteus mirabilis* (Ulubelen et al, 1994). Another study (Peana et al, 1999) demonstrated that clary exerts a weak antimicrobial effect against *S. aureus, C. albicans, Escherichia coli,* and *Staphylococcus epidermidis.* However, the antimicrobial effect increased as the microbes remained in contact with the chemical component for longer periods.

Antitumor Action

The Tn antigen, which is a specific marker in several human carcinomas, has been isolated from *Salvia sclarea.* The identification of the marker came from SSL, a lectin present in clary (Medeiros, 2000). Although still in the preliminary stages, this research on the possible antitumor action of clary shows promise. Cytotoxic and proapoptotic action from the diterpenoids in clary was identified in the lab (Rózalski et al, 2006). Also, the antibacterial and cytotoxic activity was identified in the lab after using the dilution method (Hayet et al, 2007).

Product Availability

Essential oil

Plant Parts Used: Essential oil of leaves and flowers

Dosages

- Adult: dosages are not clearly delineated in the literature.

Contraindications

Class 1 herb.

Clary should not be used during pregnancy and breastfeeding. It should not be given to children. Persons who have estrogen-sensitive cancers, breast cysts, and uterine fibroids should not use this herb. Undiluted essential oil should not be applied topically or taken internally.

Side Effects/Adverse Reactions

CNS: Drowsiness, headache, euphoria, dizziness, nightmares, stupor (high doses)
ENDO: Increased menstrual bleeding

Interactions

Drug

Alcohol, hypnotics: Clary increases the action of alcohol, hypnotics (theoretical); do not use concurrently.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Diterpenoids	Sclareol	Antimicrobial; cytotoxic, proapoptic
	Manool; Salvipisone; Ferruginol; Microstegiol; Candidissiol	
Sesquiterpene	Caryophyllene oxide	Antimicrobial
	Spathulenol; Dehydrosalvipisone; Oxoroyleanone	

Continued

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Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Alpha-amyrin		
Beta-sitosterol		
Flavonoid	Apigenin; Luteolin; 4-Methylapigenin	
Essential oil	Nerol	Estrogen-like
Linalyl acetate		
Linalool		
Pionene		
Lectin	SSL	Antitumor

Client Considerations

Assess

- Determine the reason the client is using clary.
- Assess for the use of alcohol and hypnotics (see Interactions).

Administer

- Instruct the client to store clary in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use clary in children or those who are pregnant or breast-feeding until more research is available.
- Advise the client not to use alcohol or hypnotics while taking this herb.

Clematis

(kli-ma'tuhs)

Scientific name: *Clematis virginiana* L.

Other common names: Devil's darning needle, old man's beard, traveller's joy, vine bower, woodbine

Origin: Clematis is a perennial shrub found in Asia and North America.

Uses

Clematis is used both externally and internally to treat frontal and migraine headaches. It is also used to treat skin disorders, hypertension, and varicose veins (Jellin et al, 2008). Clematis is rarely used and is not easily found over the counter.

Actions

Clematis is rarely used today because of the availability of safer herbs and drugs. The fresh juice reportedly contains protoanemonin, a vesicant oil, which is a direct irritant to the skin and mucous membranes (American Herbal Products Association, 1988).

Product Availability

Extract, juice

= Pregnancy = Pediatric = Alert = Popular Herb

Plant Part Used: Fresh leaves

Dosages

- Adult PO extract: 0.5-2ml tid in water (Moore, 1996)
- Adult topical: apply prn

C

Contraindications

Until more research is available, clematis should not be used during pregnancy and breastfeeding. It should not be given to children. Persons with vasculitis should not use this herb (Moore, 1996).

Side Effects/Adverse Reactions

EENT: Severe mucous membrane irritation
GI: Irritation, colic, diarrhea
GU: Irritation
INTEG: Severe irritation
Toxicity: *Dizziness, seizures, confusion, death (rare)*

Interactions

Drug

All Western medications: Avoid concurrent use with all Western medications (Moore, 1996).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Saponin	Anemonin	Central nervous system stimulant
	Protoanemonin	Vesicant oil

Client Considerations

Assess

- Assess the reason the client is using clematis.
- Assess for the characteristics of migraine headache: aura, halo, and blurred vision; location, intensity, and duration of pain; need for opioids in the past; alleviating, aggravating, and nutritional factors.
- Assess for toxicity.
- Assess for medication use (see Interactions).

Administer

- Instruct the client to use activated charcoal to treat overdose. Asphyxiation is the cause of death.

Teach Client/Family

- Caution the client not to use clematis in children or those who are pregnant or breastfeeding until more research is available.
- Caution the client not to allow clematis to remain in extended contact with the skin or mucous membranes; blistering is common.

Cloves

(klowvz)

Scientific names: *Syzygium aromaticum, Eugenia caryophyllata, Caryophyllus aromaticus*

Other common names: Oil of cloves, oleum caryophylli

Origin: Cloves are found in South America, Sumatra, and Tanzania.

Uses

Cloves are used mainly as an essential oil; a treatment for toothache; a topical anesthetic in dentistry; and an antiseptic, antibacterial, and antiinflammatory for the oral mucosa. They may also be used as a flavoring or antimicrobial in formulas.

Actions

Clove oil possesses antihistamine, spasmolytic, mildly antiseptic, anthelmintic, and larvicidal properties.

Topical Anesthetic Action

When applied topically, cloves have been found to inhibit prostaglandin synthesis, cyclooxygenase, and lipoxygenase. Eugenol, one of the chemical components of cloves, is responsible for these actions (Rasheed et al, 1984).

Antimicrobial Action

In underdeveloped countries where most people cannot afford the high cost of medications, cloves have been used to treat diarrheal diseases in children. In one study, the antibacterial effect of cloves was tested using a decoction of aqueous dried extract. The extract showed activity against *Salmonella* E., *Shigella* D., *Shigella* F., *Escherichia coli,* and *Enterobacter* (Tsakala et al, 1996). Another study investigated the efficacy of cloves against cytomegalovirus (CMV). Cloves demonstrated significant effectiveness against CMV in low concentrations in vitro (Yukawa et al, 1996). *Syzygium aromaticum* showed active inhibition of hepatitis C virus (HCV) when tested with 71 medicinal plant extract (Hussein et al, 2000). Another study (Dorman et al, 2000) investigated the volatile oils in several medicinal plants, including cloves. All oils exhibited significant antimicrobial effect (Dorman et al, 2000).

Other Actions

Cloves have shown slight antioxidant properties when used on rats with aflatoxins (Abdel-Wahhab et al, 2005). This could be due to two chemical components, eugenol and acetyl-eugenol, both phenols.

Product Availability

Component in cigarettes and mouthwash; essential oil; tincture

Plant Part Used: Dried flower buds

Dosages

- Adult mouthwash: ≤1 oz of 1%-5% essential oil prn
- Adult PO tincture: 5-30 drops (1:3 dilution) prn
- Adult PO: 120-300 mg (Jellin et al, 2008)
- Adult topical: 1-5 drops essential oil prn
- Adult topical tincture: 15% for athletes foot (Jellin et al, 2008)

Contraindications

Class 1 herb.

Until more research is available, do not use cloves medicinally during pregnancy and breastfeeding. Do not give them to children. Essential oil should be used only when diluted in a carrier oil.

Side Effects/Adverse Reactions

CNS: *Depression, seizures*
EENT: Tissue irritation, airway injury
HEMA: *Disseminated intravascular coagulation*
INTEG: Skin irritation
RESP: *Bronchospasm, pulmonary edema*

Interactions

Drug

Anticoagulants, platelet inhibitors, salicylates: Cloves may increase the effect of these products.

Lab Test

PT, INR, AST, ALT, alkaline phosphatase: Cloves may increase these levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Phenol	Eugenol; Acetyl Eugenol; Beta-caryophyllene	Antimicrobial; analgesic; antioxidant
Terpene		Local anesthetic

Client Considerations

Assess

- Assess the reason the client is using cloves medicinally.
- Assess for allergic reactions (bronchospasm, pulmonary edema). If allergic symptoms are present, use of the herb should be discontinued and emergency measures instituted.

Administer

- Instruct the client to store cloves in a cool, dry place, away from heat and moisture.
- Instruct the client to dilute essential oil in a carrier oil.

Teach Client/Family

- Caution the client not to use cloves medicinally in children or those who are pregnant or breastfeeding until more research is available.

Coenzyme Q10

(koe-ehn′zime kyew tehn)

Scientific name: *2,3 dimethoxy-5 methyl-6-decaprenyl benzoquinone*

Other common names: Co-Q10, mitoquinone, ubidecarenone, ubiquinone

Origin: Coenzyme Q10 is found in dietary sources.

Uses

Coenzyme Q10 is used to treat ischemic heart disease, congestive heart failure (CHF), angina pectoris, hypertension, arrhythmias, diabetes mellitus, deafness, Bell's palsy, decreased immunity, mitral valve prolapse, periodontal disease, and infertility.

Investigational Uses

Research is underway to determine the efficacy of coenzyme Q10 in the treatment of breast cancer. Migraine prevention is also being investigated as a possible use of Q10 (Rozen et al, 2002). Research has confirmed that coenzyme Q10 does not slow the progression of Huntington's disease (The Huntington Study Group, *Neurology,* 2001) or congestive heart failure (Khatta et al, 2000).

Actions

Coenzyme Q10 is a fat-soluble vitamin-like compound known as ubiquinone. It is synthesized in humans and is involved in adenosine triphosphate (ATP) generation. Coenzyme Q10 functions as an endogenous antioxidant, protecting against free radial damage within the mitochondria.

Myocardial Enhancement

Researchers have discovered lowered levels of coenzyme Q10 in patients with cardiac conditions such as ischemic heart disease (Hanaki et al, 1991) and dilated cardiomyopathy (Langsjoen et al, 1990). The greater the severity of the cardiac disease, the lower the coenzyme Q10 level (Littarru et al, 1972). In one study of 88 patients with cardiomyopathy who received 100 mg/day of coenzyme Q10 for up to 2 years, 75% of the patients improved significantly as noted by ejection fraction and cardiac output (Langsjoen et al, 1988). In another study of patients with cardiomyopathy who received coenzyme Q10 for 12 weeks, stroke volume and ejection fraction improved significantly after treatment (Langsjoen et al, 1985).

Adriamycin Toxicity Prevention

Coenzyme Q10 has been shown to prevent cardiac toxicity associated with adriamycin therapy. In studies using lab animals given adriamycin followed by coenzyme Q10, the restoration of appropriate coenzyme Q10 levels prevented changes in the heart (Domae et al, 1981; Ogura et al, 1979). Therefore, it appears that coenzyme Q10 may be used to prevent adriamycin cardiac toxicity in humans, but more research is needed to confirm this assumption.

Other Actions

Coenzyme Q10 has shown promise as a migraine preventive agent. Thirty-two patients with a history of episodic migraines were given 150 mg/day of coenzyme Q10. There was a 50% reduction in number of days with migraines (Rozen et al, 2002). Coenzyme Q10 is being studied for antiparkinson's disease and other neurologic diseases (Littarru et al, 2005; Sharma et al, 2006).

Product Availability

Capsules, tablets

Dosages

Dosages vary widely.

Breast Cancer, Cardiovascular Disease, Diabetes

- Adult PO: >300 mg/day (La Valle et al, 2001)

Other

- Adult PO: 30-200 mg/day (La Valle et al, 2001)

Contraindications

Until more research is available, coenzyme Q10 should not be used at excessive levels during pregnancy and breastfeeding. It should not be given to children. Persons with hypersensitivity should not use this nutritional supplement.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, diarrhea, epigastric pain

Interactions

Drug

Anticoagulants *(heparin, warfarin):* Coenzyme Q10 may decrease the action of anticoagulants; avoid concurrent use.

Antidiabetics, beta-blockers, HMG-CoA reductase inhibitors, phenothiazines *(chlorpromazine)****, tricyclic antidepressants:*** Antidiabetes agents, beta-blockers, HMG-CoA reductase inhibitors, certain phenothiazines (chlorpromazine), tricyclic antidepressants may decrease the action of coenzyme Q10 and deplete endogenous stores; avoid concurrent use.

Herb

L-carnitine: Giving with coenzyme Q10 can lead to additive action (Jellin et al, 2008).

Pharmacology

Pharmacokinetics

Supplements are absorbed at the levels of 2% to 3%. Peak occurs at approximately 6 hours.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Ubiquinone Benzoquinone		Antioxidant

Client Considerations

Assess

- If the client is using coenzyme Q10 for a cardiovascular condition, assess cardiovascular status (blood pressure; pulse rhythm, character).
- Assess medication use (see Interactions).

Administer

- Instruct the client to store coenzyme Q10 away from moisture and light.

Teach Client/Family

- Caution the client not to use coenzyme Q10 at increased levels in children or those who are pregnant or breastfeeding until more research is available.
- Instruct the client to avoid concurrent use of coenzyme Q10 with anticoagulants, or to have lab parameters monitored carefully if used concurrently.
- Advise the client to avoid using coenzyme Q10 with phenothiazines, tricyclics, beta-blockers, and cholesterol-lowering agents.

Coffee

(kaw'fee)

Scientific name: *Coffea* spp.

Other common names: Bean juice, café, espresso, java, mocha

Origin: Coffee is found in Central and South America.

Uses

Coffee is used to increase alertness, mood, exercise tolerance, and to enhance bronchodilation. Historically, coffee was administered by mouth for asthma, headache, and colds, or by rectum as an antidote for opium poisoning. It is used in herbal medicine to stimulate the appetite and facilitate digestion. Coffee promotes peristalsis and accelerates circulation (Felter, 1922). It may prevent onset of Parkinson's disease and gallstones (Jellin et al, 2008).

Actions

The xanthine group has been studied extensively in mainstream pharmacology research. Xanthines, of which caffeine is one, stimulate the central nervous system by binding to adenosine receptors in the brain. One study researched the effects of elevated homocysteine concentrations, which are present in unfiltered coffee. Elevated homocysteine levels are a risk factor for cardiovascular disease. Consumption of 1 L of unfiltered coffee per day for 14 days significantly raised fasting homocysteine concentrations by 10% (Grubben et al, 2000). Another study researched the possible correlation between coffee consumption and decreased risk of gallstone disease in men. Of the 1081 subjects who had symptomatic gallstone disease, 885 required cholecystectomy. After adjusting for other factors, results showed that the men who consumed two to three cups of coffee per day showed a decrease in gallstone disease, while those who drank four or more cups of coffee per day showed an even greater decrease in the disease (Leitzmann et al, 1999).

Coffee consumption may lower blood uric acid levels. This study showed levels of uric acid significantly decreased with coffee intake, but not with tea (Choi, Curran, 2007, Choi, Willett, Curran, 2007). Coronary calcification was inversely associated with coffee consumption. A sample of 1570 men and women without coronary artery disease participated in this study (Rizzo, 2008). The results may be due to the diterpene in coffee.

Product Availability

Roasted seed (beans)

Plant Part Used: Seeds

Dosages

• Adult PO infusion: 2-8 oz (Felter, 1922)
NOTE: Lethal dose is approximately 100 cups of coffee

C

Contraindications

Class 2b/2d herb.
Until more research is available, coffee should not be used medicinally during pregnancy and breastfeeding. It should not be given to children. Coffee should also be avoided by persons with cardiovascular disease because of increased homocysteine levels, anxiety, bleeding disorders, osteoporosis, glaucoma, and duodenal or gastric ulcers.

Side Effects/Adverse Reactions

CNS: Headache, insomnia, increased affect and mood, decreased seizure threshold, dizziness, irritability, depression
CV: Palpitations, extrasystole, restlessness, increased blood pressure
GI: Nausea, vomiting, gastroesophageal reflux disease, peptic ulcer
GU: Increased diuresis
MS: Tremors

Interactions

Drug

Alendronate: Coffee may decrease the effect significantly.
Antacids, H_2-blockers, proton pump inhibitors: Coffee may decrease the action of these products (theoretical) (Jellin et al, 2008).
Aspirin, disulfiram, mexiletine, quinolones, riluzole, terbinafine, theophylline, verapamil: These drugs may increase caffeine levels and possibly increase adverse reactions (theoretical) (Jellin et al, 2008).
Benzodiazepines: Caffeine reduces the benzodiazepine effect.
Beta-blockers: Caffeine increases blood pressure in those taking beta-blockers.
Bronchodilators, xanthines *(theophylline):* Large amounts of coffee increases the action of some bronchodilators, and xanthines such as theophylline.
Estrogens, hormonal contraceptives: These agents may decrease metabolism of caffeine with possibility of adverse reactions (theoretical) (Jellin et al, 2008).
Lithium: Levels of lithium are decreased by caffeine.
MAOIs: Large amounts of coffee should be avoided; hypertensive reactions may occur.

Herb

Caffeine-containing herbs *(cocoa, cola nut, guarana, yerba maté):* Use with these herbs may lead to increased levels and increased adverse reactions (Jellin et al, 2008).
Ephedra: Concurrent use of ephedra and coffee may increase hypertension and central nervous system stimulation; avoid concurrent use.
Minerals *(calcium, magnesium):* Caffeine may increase the excretion of these minerals.

Food

Grapefruit juice: This juice may increase caffeine levels.

Continued

Interactions—cont'd

Lab Test

AST: Coffee may decrease test values in alcoholics.
Secretion provocation test: Coffee may increase test values.
Serum 2-hour postprandiol glucose: False increase if caffeine is ingested during test.
Specimen infertility screen: Heavy coffee consumption may decrease number of motile sperm.

Pharmacology

Pharmacokinetics

Half-life 3½-4½ hours.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Xanthine	Caffeine	Central nervous system stimulant
Diterpene		Increased cholesterol, low-density lipoproteins, triglycerides
Chlorogenic acid		
Galactomanan protein		
Free amino acid		
Polyamine		
Tannin		Wound healing; antiinflammatory
Vitamin B		
Mineral	Niacin (trace)	
Coffee Oil Contains		
Fatty acid		
Stearic acid		
Sterol		
Tocopherol		
Cafestol		
Cahweol		
Lanosterol		

Client Considerations

Assess

- Assess the reason the client is using coffee medicinally.
- Determine how much coffee the client consumes and its effect on mood, affect, and sleep patterns.

- Assess cardiac status of clients with cardiac disease (blood pressure, pulse, increased palpitations; hypertension and tachycardia may also be present).
- Assess for the use of bronchodilators, xanthines, and ephedra (see Interactions).

Administer

- Instruct the client to store coffee in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use coffee medicinally in children or medicinally in those who are pregnant or breastfeeding until more research is available.
- Inform the client that withdrawal symptoms are common after the use of coffee for extended periods.

Cola Tree

(koe'luh tree)

Scientific names: *Cola nitida, Cola acuminata*

Other common names: Bissy nut, cola nut, guru nut, kola nut, kolatier

Origin: The cola tree is an evergreen found in parts of Africa and Indonesia.

Uses

Cola tree is used as an antidepressant, a diuretic, and an antidiarrheal. It is used to treat heart disease, dyspnea, fatigue, morning sickness, and migraines. Cola tree may also be used topically to promote wound healing and reduce inflammation.

Actions

Cola tree products have been used by people on the Ivory Coast to stimulate the central nervous system. The tribes of Hausa-Fulani in the northern part of Nigeria use *Cola nitida* (Ibu et al, 1986). Because tannins, which possess carcinogenic effects, are present in the cola nut, this herb is not recommended for extended use (Morton, 1992).

Hormonal Action

In a study using rat pituitary cells, the cells first were treated for 24 hours with differing doses of cola extract, then stimulated with luteinizing hormone-releasing hormone (LH-RH). The findings indicated that cola species inhibit LH-RH. With more studies, results may point to the ability of cola tree products to regulate gonadotropin release (Benie et al, 1987).

Antiinfective Action

One study has identified the antiinfective action of the aqueous and alcoholic extracts of *Cola nitida* (bark) when tested against pathogenic bacteria. The results showed that the extracts inhibited beta-hemolytic streptococci, *Escherichia coli, Neisseria gonorrhoeae, Pseudomonas aeruginosa, Staphylococcus aureus, Klebsiella pneumoniae, Proteus mirabilis* (Ebana et al, 1991), and mycobacteria (Adeniyi et al, 2004). Another study (Kamagate et al, 2002) indicated that kola extract is not effective against bacteria at regular doses used by chewing.

Other Actions

Other actions of cola tree products include central nervous system stimulation, increased gastric acid flow, mild diuresis, and a mild positive chronotropic effect. One study identified the effects of *Cola nitida* on the locomotor activities of

mice. Low doses had no effect, whereas high doses exerted a depressive effect (Ajarem, 1990).

Product Availability

Cola nut, cola wine, fluid extract, powdered herb, solid extract, tincture

Plant Part Used: Seeds

Dosages

- Adult PO cola extract: 0.25-0.75 g/day (Blumenthal, 1998)
- Adult PO cola fluid extract: 2.5-7.5 g/day (Blumenthal, 1998)
- Adult PO cola nut: 2-6 g/day (Blumenthal, 1998)
- Adult PO cola wine: 60-180 g/day (Blumenthal, 1998)
- Adult PO decoction: 1-2 tsp powder in 1 cup water, boiled 15 min
- Adult PO fluid extract: 5-40 drops bid-tid with meals, mixed in a small amount of liquid
- Adult PO solid extract: 2-8 grains tid
- Adult PO tincture: 10-30 g/day (Blumenthal, 1998)

Contraindications

Class 2b/2d herb (seeds).

Until more research is available, cola tree products should not be used during pregnancy and breastfeeding. It should not be given to children. These products should not be used by persons with hypersensitivity to chocolate or with stomach or duodenal ulcers. Persons with cardiac disease such as ischemic heart disease, hypertension, arrhythmias, or heart palpitations should avoid their use. Cola tree products should be used with caution by persons with anxiety, nervousness, or mood disorders. Avoid prolonged use.

Side Effects/Adverse Reactions

CNS: Anxiety, insomnia, nervousness, irritability, restlessness, headache
CV: Hypertension, hypotension, tachycardia, bradycardia, palpitations
GI: Nausea, vomiting, anorexia, abdominal distress, cramps, gastrointestinal mucosa irritation, bright yellow oral pigmentation (Ashri, 1990)
GU: Diuresis
INTEG: Hypersensitivity reactions

Interactions

Drug

Analgesics: Cola tree products may increase the effect of analgesics; avoid concurrent use.
Antacids, H_2-blockers, proton pump inhibitors: Coffee may decrease the action of these products (theoretical) (Jellin et al, 2008).
Antiinfectives *(quinolones):* Quinolones may increase the effect of cola tree.
Aspirin, disulfiram, mexiletine, riluzole, terbinafine, theophylline, verapamil: These drugs may increase caffeine levels and possibly increase adverse reactions (theoretical) (Jellin et al, 2008).
Benzodiazepines *(diazepam, clonazepam, temazepam, triazolam):* Benzodiazepines may decrease the effect of cola tree products.
Beta-blockers *(metoprolol, propranolol):* Cola tree products may increase blood pressure when used with beta-blockers.

Interactions—cont'd

Estrogens, hormonal contraceptives: May decrease metabolism of caffeine with possibility of adverse reactions (theoretical) (Jellin et al, 2008).
Furoquinolones*(alatrofloxacin, ciprofloxacin, levofloxacin)*, ***salicylates*** *(aspirin):* Furoquinolones, salicylates (aspirin) may increase the effect of cola tree products.
Lithium: Lithium may decrease the effect of cola tree, caffeine-containing products.
MAOIs *(phenelzine, tranylcypromine):* Cola tree products may increase blood pressure when used with phenelzine and tranylcypromine.
Psychoanaleptic agents: Cola tree products may increase the action of psychoanaleptic agents.
Xanthines: Cola tree products may increase the action of xanthines (e.g., theophylline, caffeine); avoid concurrent use.

Herb

Ephedra: Concurrent use of ephedra and cola tree may increase hypertension and central nervous system stimulation; avoid concurrent use.
Minerals *(calcium, magnesium):* Caffeine may increase the excretion of these minerals.

Food

Caffeinated coffee, cola, tea, grapefruit juice: Cola tree may increase the effects of these products.

Pharmacology

Pharmacokinetics

Caffeine crosses the placenta and enters breast milk.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Components	Possible Action
Alkaloid	Theobromine; Caffeine; Theophylline	Central nervous system stimulant
Tannin		Carcinogenic
Cardiac glycoside		
Anthraquinone		Laxative
Glucide		
Saponin		
Flavonoid		
Phenol		
Catechin		
Epicatechin		

Client Considerations

Assess

- Assess for hypersensitivity reactions. If these are present, discontinue the use of cola tree products and administer antihistamines or other appropriate therapy.

- Assess cardiac status in cardiac patients (blood pressure, pulse, palpitations, hypertension, tachycardia).
- Assess the client's mental status (affect, mood, euphoria).
- Assess for the use of medications, caffeinated drinks, and ephedra (see Interactions).

Administer

- Instruct the client to store cola tree products in a sealed container in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use cola tree products in children or those who are pregnant or breastfeeding until more research is available.
- Instruct the client not to confuse the cola tree herb with other types of cola.

Colostrum, bovine

(ke-la′-strem)

Other common names: Bovine immunoglobulin, colostrum, hyperimmune bovine colostrum

Origin: Colostrum is secreted by new mothers for a few days after giving birth.

Uses

Colostrum is used in graft-versus-host disease, in rotavirus diarrhea in children, to burn fat, to stimulate the immune system in HIV, and for athletic training.

Actions

Research is just beginning in regard to bovine colostrum. At present most information comes from anecdotal reports.

Product Availability

Liquid, powder

Dosages

Athletic Training

- Adult PO: 125 ml bid (not available in the United States)

AIDS-Related Cryptospordium Diarrhea

- Adult powder: 10 g × 21 days

Contraindications

Bovine colostrum should not be used in children or those who are pregnant, breastfeeding, or hypersensitive to bovine milk.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, increased hepatic function tests
HEMA: Decreased hematocrit

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Protein		
Carbohydrates		
Fat		
Vitamins		
Minerals		
Immunoglobulins	IgA	Stimulate immunity
	IgG	Stimulate immunity
	IGF	
	IGF-I	
	Phosphatidylethanolamine	

Client Considerations

Assess

- Assess the reason the client is using bovine colostrum.

Administer

- Keep bovine colostrum in a dry area, away from direct sunlight.

Teach Client/Family

- Teach the patient that bovine colostrum should not be used in children or those who are pregnant or breastfeeding until more research is available.

Coltsfoot

(koeltz′ fut)

Scientific name: *Tussilago farfara*

Other common names: British tobacco, bullsfoot, coughwort, donnhove, farfara, fieldhove, filius ante patrem, flower velure, foal's-foot, foalswort, hallfoot, horse-foot, horse-hoof, kuandong hua, pas díane

Origin: Coltsfoot is a perennial found in Europe; the United States; Canada; and central, western and northern Asia.

Uses

Coltsfoot is used to treat respiratory conditions such as bronchitis, cough, and asthma. It is also used to treat inflammation of the oral mucosa.

Investigational Uses

Research is underway concerning coltsfoot as an antimicrobial.

Actions

Two studies have demonstrated the ability of coltsfoot to inhibit nitric oxide synthesis in macrophages. The clinical significance of this finding is unknown, however (Ryu et al, 1999). Another study found that coltsfoot inhibits the binding of both platelet

activating factor and Ca^{2+} entry blocker to membrane vesicles (Hwang, 1987). Other studies have focused on the toxic effects of *Tussilago farfara* L. and the isolation of new chemical components (Sperl et al, 1995; Wang et al, 1989; Liu et al, 2006). The screening of 16 medicinal plants showed that 6 possessed significant antimicrobial action (Kokoska et al, 2002; Kim et al, 2006).

Product Availability

Dried herb, extract, syrup, tea, tincture

Plant Parts Used: Dried flowers, leaves, roots

Dosages

- Adult PO decoction: 0.6-2.9 g dried herb
- Adult PO dried herb: 4.5-6 g/day (Blumenthal, 1998)
- Adult PO fluid extract: 0.6-2 ml tid (1:1 dilution in alcohol 25% concentration)
- Adult PO syrup: 2-8 ml tid (1:4 dilution)
- Adult PO tea: 1-3 tsp dried herb in 8 oz boiling water, let stand 10 min, strain, take tid

Contraindications

Class 2b/2c/2d herb (flowers).

Coltsfoot should not be used during pregnancy and breastfeeding. It should not be given to children. Coltsfoot should not be used by persons with hepatic disease or those who are hypersensitive to ragweed, chamomile, or other members of the composite family. Persons with cardiac disease, or hypertension should use this herb cautiously. Coltsfoot should not be used for longer than 6 weeks. Pyrrolizidine alkaloid content should not exceed 10 mcg.

Side Effects/Adverse Reactions

CNS: Fever
CV: Hypertension
GI: Nausea, vomiting, anorexia, diarrhea, jaundice, *hepatotoxicity (rare)*
INTEG: Hypersensitivity reactions
RESP: Upper respiratory infection

Interactions

Drug

Antiarrhythmics, antihypertensives: Coltsfoot may antagonize antiarrhythmics and antihypertensives; avoid concurrent use (theoretical).

Herb

Eucalyptus: Eucalyptus may increase the toxicity of coltsfoot; avoid concurrent use (theoretical) (Jellin et al, 2008).

Pyrrolizidine alkaloid (UPA)-containing herbs *(borage, gravel root, agrimony, petasities, comfrey, dusty miller, ragwort):* Use with these herbs and coltsfoot will lead to increased toxicity; do not use concurrently (Jellin et al, 2008).

Lab Test

AST, ALT, alkaline phosphatase: Coltsfoot may increase these levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloids	Tussilagone	Pressor effect
	Senkirkine	Hepatotoxicity
	Isotussilagone; Senecionine; Senecionin	
Tannin		
Triterpenes	Arnidiol; Faradiol; Beta-amyrin	
Sesquiterpenoid	Bisabolene; Epoxide (Ryu et al, 1999)	Inhibition of nitric oxide synthesis
	Farfaratin (Wang et al, 1989)	
Flavonoids		
Phytosterol		
Mucilage		Demulcent

Client Considerations

Assess

- Assess the reason the client is using coltsfoot.
- Assess for hypersensitivity reactions. If these are present, discontinue the use of this herb and administer antihistamines or other appropriate therapy.
- Assess for hepatotoxicity (increased hepatic function tests, jaundice, clay-colored stools, right upper-quadrant pain). If these occur, herb use should be discontinued.
- Assess for the use of antiarrhythmics and antihypertensives (see Interactions).

Administer

- Instruct the client to store coltsfoot products in a cool, dry place, away from heat and moisture.
- Because of the presence of hepatotoxic pyrrolizidine alkaloids, caution the client not to use coltsfoot for longer than 6 weeks.

Teach Client/Family

- Caution the client not to use coltsfoot in children or those who are pregnant or breastfeeding because hepatotoxicity may occur.
- Advise the client to report any side effects to the provider.
- Caution the client not to confuse peppermint with coltsfoot; they are similar in appearance.

Comfrey

(kuhm′free)

Scientific name: *Symphytum officinale*

Other common names: Black root, blackwort, boneset, bruisewort, consound, gum plant, healing herb, knitback, knitbone, salsifly, slippery root, wallwort

Origin: Comfrey is a perennial found in the United States, Australia, and parts of Asia. It is cultivated in Japan.

Uses

Comfrey is used topically to promote wound healing and to decrease inflammation caused by bruises and sprains. It has also been used internally for many years as a treatment for colitis and peptic ulcer disease. However, because hepatotoxicity may occur, internal use is no longer recommended.

Actions

In the past, comfrey was used internally to treat many conditions, including gastrointestinal complaints. However, because its pyrrolizidine alkaloids can cause hepatotoxicity, comfrey is now recommended for topical use only. Comfrey should be applied once the wound has begun to heal; the allantoin stimulates cell division and wound healing. Several studies have focused on the toxic results of the internal use of comfrey (Couet et al, 1996; Mei et al, 2005). Studies have found comfrey to be carcinogenic. Plantain *(Plantago major)* can be used in place of comfrey, both internally for its healing properties and topically on open wounds.

Product Availability

Capsules, extract, ointment, tea

Plant Parts Used: Leaves, roots

Dosages

NOTE: Because of the potential for hepatotoxicity, internal use of comfrey is no longer recommended.

Wound Healing

- Adult topical products: may be applied to wounds as needed (5%-20% dried herb present in product); use no longer than 6 weeks (Blumenthal, 1998)
- Adult poultice of fresh green leaves: may be applied prn to granulate wounds over broken bones

Contraindications

Class 2a/2b/2c herb; class 3 herb (leaf, root).

Until more research is available, comfrey should not be used during pregnancy and breastfeeding. It should not be given to children. Comfrey should not be used by persons who are hypersensitive to this herb. Comfrey is for external use only, and should not be used for more than 6 weeks in 1 year. Internal use may cause fatal hepatotoxicity. Do not use this herb on broken skin. Pyrrolizidine alkaloid content should not exceed 10 mcg.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, abdominal pain, hepatomegaly, *hepatotoxicity, venoocculsive disease, hepatic adenoma (all reactions from oral use)*

GU: *Bladder tumors*

INTEG: Hypersensitivity reactions (oral and topical use)

Interactions

Herb

Eucalyptus: Eucalyptus may increase the toxicity of comfrey; avoid concurrent use (theoretical) (Jellin et al, 2008).

Interactions—cont'd

Pyrrolizide alkaloid (UPA)-containing herbs *(agrimony, borage, coltsfoot, dusty miller, gravel root, petasities, ragwort):* Use of these herbs with comfrey (internally) will lead to increased toxicity; do not use concurrently (Jellin et al, 2008).

Lab Test

ALT, AST, total bilirubin: Comfrey may increase ALT, AST, total bilirubin, and urine bilirubin.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Pyrrolizidine Alkaloids	Lasiocarpine; Symlandine; Symphytine; Echimidine	Hepatotoxic
Triterpenoid	Symphytoxide A	Hypotensive
Asparagine		
Tannin		Astringent
Allantoin		Wound healing
Mucilage		Demulcent
Polysaccharides		
Rosmarinic Acid		Antiinflammatory

Client Considerations

Assess

- If the client is taking comfrey internally, which is no longer recommended, assess for hepatotoxicity: increased hepatic function tests (AST, ALT, bilirubin), jaundice, clay-colored stools. If these symptoms are present, use of the herb should be discontinued.
- If the client is using comfrey topically to promote wound healing, assess the wound for temperature, redness, swelling, bleeding, and purulent drainage.

Administer

- Instruct the client to store comfrey products in a cool, dry place, away from heat and moisture.
- Instruct the client not to use comfrey for more than 6 weeks in 1 year.

Teach Client/Family

- Caution the client not to use comfrey in children or those who are pregnant or breastfeeding until more research is available.
- Because hepatotoxicity may occur, caution the client not to take comfrey internally. In some countries internal use has been banned.
- Advise the client not to use comfrey on broken skin. Absorption of pyrrolizidine alkaloids may occur.

Condurango

(kohn-du-rahn'go)

Scientific name: *Marsedenia condurango*

Other common names: Condor-vine bark, condurango bark, condurango blanco, eagle vine, gonolobus, condurango triana, marsedenia condurango

Origin: Condurango is found in South America.

Uses

In traditional herbal medicine, condurango is used as an astringent and as a treatment for anorexia and syphilis.

Investigational Use

Research is underway to determine the efficacy of condurango as a cancer treatment.

Actions

Antitumor Action

One study evaluated the differentiation-inducing activity of condurango in the mouse myeloid leukemia cell line. Among the chemical components of the herb, the condurango glycosides were the most potent differentiation inducers of phagocytic cells after 24 hours of treatment with these compounds. This indicates the antitumor action of condurango (Umehara et al, 1994). Another study identified the antitumor activity of this herb against sarcomas (Hayashi et al, 1980).

Other Actions

The tannins in condurango possess astringent properties that contribute to its wound healing effects.

Product Availability

Bark, fluid extract, powdered bark, tincture

Plant Part Used: Dried bark

Dosages

- Adult PO bark: 2-4 g daily (Blumenthal, 1998)
- Adult PO extract: 0.2-0.5 g daily (Blumenthal, 1998)
- Adult PO fluid extract: 2-4 g daily (Blumenthal, 1998)
- Adult PO infusion: 2 tsp powdered bark in 8 oz boiling water, let stand 15 min, take tid
- Adult PO tincture: 1-2 ml tid or 2 g daily (Blumenthal, 1998)
- Adult PO water extract: 0.2-0.5 g daily (Blumenthal, 1998)

Contraindications

Until more research is available, condurango should not be used during pregnancy and breastfeeding. It should not be given to children. Condurango should not be used by persons with hepatic disease, any seizure disorder, or a hypersensitivity to this herb or any herb in the milkweed family.

Side Effects/Adverse Reactions

CNS: *Seizures (overdose of bark), paralysis*
GI: Nausea, vomiting, anorexia, *hepatotoxicity*
INTEG: Hypersensitivity reactions, *anaphylaxis*

Interactions

Drug

Cardiac glycosides** (digoxin), **iron products: Absorption of digitoxin, digoxin, and iron products may be reduced when used with condurango; avoid concurrent use (theoretical).

***Medications metabolized by P450 enzyme system** (carbamazepine, bupropion, orphenadrine, cyclophosphamide, citalopram, azole antifungals, macrolide antibiotics, omeprazole):* Use condurango cautiously with these drugs, especially in clients with hepatic disorders.

***Medications metabolized by cytochrome P2A6 enzyme system** (carbamazepine, paroxetine, ritonavir, sertraline):* Use these medications cautiously with condurango.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Tannin		Astringent
Glycoside	Condurango A, A0, A1, B0, C, C1, D0, E0, E2 Condurangin	Antitumor
Essential oil		
Resin		
Caoutchouc		
Condruit		
Phytosterin		
Sitosterol		
Vanillin		
Coumarin		
Esculetin		
Flavonoid		
Acid	Caffeic acid; Cholorogenic acid	Bile stimulant
Strychnine-like alkaloid		

Client Considerations

Assess

- Assess the reason the client is using condurango.
- Assess for hypersensitivity reactions. If present, discontinue the use of condurango and administer an antihistamine or other appropriate therapy.
- Assess for hepatotoxicity: increased AST, ALT, and bilirubin levels; jaundice, clay-colored stools, right upper-quadrant pain.
- Assess for adverse central nervous system reactions.
- Identify all medications taken by the client (see Interactions).

Administer

- Instruct the client to store condurango in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use condurango in children or in those who are pregnant or breastfeeding until more research is available.

Copper

(kop′ur)

Scientific names: *Copper, Cu*

Origin: Copper is an essential trace mineral.

Uses

Copper is used to prevent and treat osteoporosis and osteoarthritis, to improve wound healing, and to treat copper deficiency.

Actions

There is little scientific evidence for the use of copper in larger doses. Copper is a trace mineral found in food. There seems to be no need for extra supplementation. Acquired copper deficiency can cause hematologic/neurologic conditions (Kumar, Butz, Burritt 2007), Menkes disease, Wilson's disease, and cancer (Daniel et al, 2004).

Product Availability

Tablets, capsules

Dosages

- Adult PO: 900 mcg/day

Contraindications

Copper should not be used in high doses in children, those who are pregnant or breastfeeding, or who have renal/hepatic disease.

Side Effects/Adverse Reactions

GI: Liver, GI damage (high doses)

Client Considerations

Assess

- Assess the reason the client is using copper.

Administer

- Keep copper in a dry area, away from direct sunlight.

Teach Client/Family

- Teach the patient that copper should not be used in high doses in children or those who are pregnant or breastfeeding until more research is available.

Coriander

(koe'ree-an-duhr)

Scientific names: *Coriandrum sativum, Coriandrum sativum* var. *vulgare, Coriandrum sativum* var. *microcarpum*

Other common names: Chinese parsley, cilantro, coriander

Origin: Coriander is found throughout the world.

Uses

Coriander is used as an anthelmintic and appetite stimulant, as a treatment for arthritic conditions and dyspepsia, and as an antiseptic. It is also used as a spice and flavoring in foods.

Actions

Antilipidemic Action

Three studies using laboratory rats fed a high-fat diet have evaluated the antilipidemic action of *Coriandrum sativum* (Chithra et al, 1997, 1999, 2000). In all three studies, the use of coriander seeds lowered the lipid level significantly, with levels of total cholesterol and triglycerides decreased. The levels of low-density lipoprotein (LDL) and very-low-density lipoprotein (VLDL) cholesterol decreased, while high-density lipoprotein (HDL) cholesterol levels increased.

Antidiabetic Action

In traditional herbal medicine, coriander has been used for many years to lower blood glucose. When streptozocin-diabetic mice were fed coriander in their diet and in their drinking water, a significant reduction in blood glucose occurred. Sequential extraction revealed insulin-releasing activity (Gray et al, 1999). In an older study evaluating the antidiabetic action of several herbs, coriander was shown to decrease glucose levels in diabetic mice (Swanston-Flatt et al, 1990).

Other Actions

Fresh coriander seeds were found to exert abortifacient effects on female rats. An oral dose of 250-500 mg/kg produced an antiimplantation effect but failed to produce complete infertility (Al-Said et al, 1987). A mixed fraction of dill, cilantro, coriander, and eucalyptus essential oils showed additive, synergistic, or antagonistic effects depending on organism (Delaguis et al, 2002). A new study (Eguale et al, 2007) discusses the anthelmintic activity in vitro and in vivo. Another study (Emamghoreishi, Khasaki, Aazam, 2005) evaluated the anxiolytic effect of coriander. It has long been used for anxiety and insomnia in folk medicine. A significant antibacterial activity, as determined using the agar diffusion method, was shown when used with coriander essential oil (Lo Cantore et al, 2004).

Product Availability

Crude extract, tincture, whole herb

Plant Parts Used: Dried fruits

Dosages

Dosages vary widely.

- Adult PO decoction: 2 tsp crushed herb in 150 ml boiling water, let stand 15 min, strain, drink 8 oz before meals
- Adult PO tincture: 10-20 drops after meals
- Adult PO whole herb: 3 g/day in divided doses (Blumenthal, 1998)

Contraindications

Class 1 herb (fruit, seed).

Until more research is available, coriander (medicinally) should not be used during pregnancy and breastfeeding. It should not be given to children. Coriander should not be used by persons with hypersensitivity to this herb.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, fatty hepatic tumors

INTEG: Hypersensitivity reactions, *anaphylaxis*

Interactions

Drug

Antidiabetics: Coriander may increase the effects of antidiabetics; use together cautiously.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil	Coriandrol; linalool; Limonene; Alpha-pinenes; Cymene; Camphor; Camphene; Terpinene; Monoterpene; Phellandrene; Carvone; Geraniol; Borneol	Spasmolytic
Sitosterol		
Triacontanol		
Flavonoid	Quercetin; Isoquercetin	Antiinflammatory
	Rutin	Antioxidant; astringent
	Glucuronide; Coriandrinol	
Tannin		
Fatty acid	Oleic acid; Petroselinic acid; Linolenic acid	
Coumarin	Scopoletin; Umbelliferone	
Minerals/Vitamins	Vitamin C, Calcium, Potassium; Iron, Magnesium	

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue use of coriander and administer an antihistamine or other appropriate therapy.
- Assess for the use of antidiabetics (see Interactions).

Administer

- Instruct the client to store coriander in a sealed container away from light and moisture.

Teach Client/Family

- Caution the client not to use coriander in children or those who are pregnant or breastfeeding until more research is available.

Corkwood

(kawrk'wud)

Scientific name: *Duboisia myoporoides*

Other common names: Pituri, corkwood tree

Origin: Corkwood is found in South America and Australia.

Uses

Before commercial preparations of scopolamine were available, corkwood was used to prevent nausea and vomiting associated with motion sickness. It has also been used to decrease spasms of the gastrointestinal system.

Actions

Anticholinergic Action

Two of the chemical components of corkwood, scopolamine and hyoscyamine, exert anticholinergic activity (Griffin et al, 1975). This action inhibits acetylcholine at receptor sites in the autonomic nervous system. The results are a decrease in secretions and an increase in blood pressure, blurred vision, and other visual disturbances. One study (Jäger et al, 2006) demonstrated the anticonvulsant activity of Danish folk medicines, including corkwood.

Product Availability

Liquid, tablets, leaves

Plant Parts Used: Leaves, roots, stems

Dosages

Many different dosages are reported.

Contraindications

Until more research is available, corkwood should not be used during pregnancy and breastfeeding. It should not be given to children. Corkwood should not be used by persons with hypersensitivity to this herb or those with angle-closure glaucoma, myasthenia gravis, or gastrointestinal/genitourinary obstruction. Persons with congestive heart failure, prostatic hypertrophy, hypertension, arrhythmia, or gastric ulcer should avoid the use of corkwood.

Side Effects/Adverse Reactions

CNS: Confusion, anxiety, restlessness, irritability, headache, dizziness, flushing, hallucinations
CV: Palpitations, tachycardia, postural hypotension
EENT: Blurred vision, dry mucous membranes
GI: Nausea, vomiting, anorexia, dry mouth, constipation, abdominal distress

Continued

Side Effects/Adverse Reactions—cont'd

GU: Hesitancy, retention
INTEG: Hypersensitivity reactions
RESP: Tachypnea

Interactions

Drug

Alcohol, antihistamine, opioids, phenothiazines, tricyclics: An increased anticholinergic effect occurs when corkwood is used with alcohol, antihistimines, opioids, phenothiazines, and tricyclics.
Antiparkinson agents: Corkwood may interfere with the effect of antiparkinson agents.
Beta-blockers, cardiac glycosides: Corkwood may alter cardiac function.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Phenolic Glycosides	Primulaverin, Primeverin (Müller et al, 2006)	Anticonvulsant
Alkaloid	Scopolamine; Hyoscyamine Valtropine; Valeroidine	Anticholinergic
Leaves Alkaloid Nicotine	Butropine	

Client Considerations

Assess

- Assess the reason the client is using corkwood.
- Assess for hypersensitivity reactions. If present, discontinue the use of corkwood and administer an antihistamine or other appropriate therapy.
- Assess the client's mental status (mood, affect, anxiety, restlessness).
- Assess for urinary hesitancy or retention.
- Assess for medication use (see Interactions).

Administer

- Instruct the client to store corkwood products away from moisture and light.
- Advise the client to use hard candy, liquids, and chewing gum to alleviate dry mouth.

Teach Client/Family

- Caution the client not to use corkwood in children or those who are pregnant or breastfeeding until more research is available.
- Advise the client to avoid driving and operating machinery if dizziness occurs.
- Inform the client that if using for scopolamine effect, other sources are a better choice (Jellin et al, 2008).

Couchgrass

(kuch'gras)

Scientific names: *Agropyron repens, Elymus repens, Graminis rhizomo, Triticum repens* L.

Other common names: Cutch, dog grass, durfa grass, quack grass, quitch grass, Scotch quelch, triticum, twitch-grass, witch grass

Origin: Couchgrass is found in Europe and is now grown in the United States.

Uses

Couchgrass is used in the treatment of cystitis, urethritis, prostatitis, upper respiratory conditions, gout, rheumatism, and cough. It is also used as an irrigant to treat urinary tract disorders with inflammation, as a demulcent and antimicrobial, and to prevent renal gravel. The juice of the roots is used to treat cirrhosis of the liver, and some species are used to treat tumors and cancer. Couchgrass is not commonly used today.

Actions

No research is available on the actions of this herb. Existing studies focus on the composition of the chemical components of couchgrass.

Urolithiasis Action

Grasses et al (1995) reports that although the use of *Agropyron repens* does not improve urolithiasis of calcium oxalate stones, alterations in diet does affect the formation of calcium oxalate stones. This study compared three different diets: standard, high glucosidic, and high protein. An increase in citraturia occurred when *A. repens* was added to a high-protein diet, resulting in a reduction in stone formation.

Antimicrobial Action

Limited research is available on the antimicrobial action of couchgrass. The essential oil, agropyrene, has been shown to possess antimicrobial effects.

Product Availability

Capsule, cut rhizome, fluid extract, tablet, tincture

Plant Part Used: Rhizome

Dosages

No published dosage is available for irrigation.

- Adult PO decoction: place 2 tsp cut rhizome in 8 oz water, bring to a boil, simmer 10 min, use tid; a single dose consisting of approximately 3-10 g of the herb can also be used
- Adult PO fluid extract: a 1:1 dilution is recommended
- Adult PO tincture: use 2-4 ml tid (1:5 dilution recommended)

Ulcerative Colitis

- Adult PO juice: 100 mg daily × 1 mo (Jellin et al, 2008).

Contraindications

Pregnancy category is 3; breastfeeding category is 2A.

Do not use couchgrass as an irrigant if edema caused by cardiac or renal conditions is present.

Continued

Side Effects/Adverse Reactions

INTEG: Rash
META: Hypokalemia, hyperglycemia

Interactions

Drug

Antidiabetics: Couchgrass may increase hyperglycemia.
Diuretics: Potassium wasting diuretics with couchgrass may lead to hypokalemia.

Lab Test

Blood glucose: Couchgrass may increase blood glucose levels.
Potassium: Couchgrass may decrease potassium level.

Pharmacology

Pharmacokinetics

Mannitol, present in couchgrass, is poorly absorbed by oral route. Most other pharmacokinetics and pharmacodynamics are unknown.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Polysaccharide	Triticin	
Mucilage		Cancer prevention
Saponin		
Sugar alcohol	Mannitol; Inositrol	Diuretic
Essential oil	Agropyrene	Antifungal
	Polyacetylene; Carvone	Antimicrobial
Vanilloside		
Vanillin		
Phenolcarboxylic acid		
Silicic acid		
Silicate		
Lectin		
Vitamin	A; B complex	
Mineral	Iron	

Client Considerations

Assess

- Assess potassium levels if use is frequent.
- Assess for skin rash if product comes in contact with the skin.
- Assess the client for cardiac and renal disorders. If edema is present, do not use couchgrass as an irrigant.

Administer

- Instruct the client to take couchgrass PO as a decoction or extract.
- Instruct the client to store the herb in a sealed container in a dry, dark environment.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 2A.

Cowslip

(kow′slip)

Scientific name: *Primula veris*

Other common names: Artetyke, arthritica, buckles, crewel, drelip, fairy cup, herb Peter, key of heaven, key flower, may blob, mayflower, our lady's keys, paigle, palsywort, password, peagle, petty mulleins, plumrocks

Origin: Cowslip is found in the western region of the United States, Europe, and western Asia.

Uses

Cowslip is used to treat insomnia, anxiety, restlessness, and nervousness. The root is used for chronic cough.

Actions

Respiratory Action

One study conducted in Europe evaluated the effect of pharmacotherapeutic options and herbal remedies for bronchitis. The herbal remedy *Primula veris* showed an effect equal to that of pharmacologic treatments (Ernst et al, 1997), as did several other combination herbal products with oil of eucalyptus, peppermint, anise, and ivy extract.

Other Actions

Older studies have identified both hypotensive and hypertensive effects of saponins, chemical components in *Primula veris.* The saponin may be responsible for this action. Two flavonoids, quercetin and apigenin, are responsible for the antiinflammatory and antispasmodic effects of cowslip. These effects are common in all herbs with these chemical components.

Product Availability

Dried herb, fluid extract

Plant Part Used: Flowers

Dosages

- Adult PO fluid extract: 1-2 ml tid (1:1 dilution in alcohol 25%)
- Adult PO infusion: 1-2 g dried herb, tid

Contraindications

Class 1 herb (flower, root).

Until more research is available, cowslip should not be used during pregnancy and breastfeeding. It should not be given to children. Cowslip should not be used by persons with hepatic disease, gastrointestinal conditions, or hypersensitivity to this herb.

Side Effects/Adverse Reactions

CV: Hyper/hypotension
GI: Nausea, vomiting, anorexia, diarrhea, gastritis, *hepatotoxicity*
INTEG: Hypersensitivity reactions, contact dermatitis
SYST: Hypersensitivity

Continued

Interactions

Drug

Antihypertensives, diuretics: Cowslip may increase the effect of antihypertensives, diuretics.

CNS depressants: Cowslip may increase the effect of antianxiety agents and sedatives/hypnotics; do not use concurrently.

Lab Test

AST, ALT, alkaline phosphatase: Cowslip may increase these levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Flavonoid	Quercetin; Apigenin	Antiinflammatory; antispasmodic
	Kaempferol	Antiinflammatory
	Luteolin; G1, 2, 3, 4, 5, 6, (Huck et al, 2000)	
Phenol	Primulaveroside; primveroside	
Saponin		Hypotensive; hypertensive
Tannin		Astringent
Volatile oil		
Carbohydrate		

Client Considerations

Assess

- Assess the reason the client is using cowslip.
- Assess for hypersensitivity reactions, including contact dermatitis. If present, discontinue use of cowslip and administer antihistamine or other appropriate therapy.
- Assess for hepatotoxicity (increased AST, ALT, bilirubin levels; jaundice; clay-colored stools; right upper-quadrant pain). If present, herb use should be discontinued and appropriate action taken.
- Assess for the use of antihypertensives, antianxiety agents, diuretics, and sedative/hypnotics (see Interactions).

Administer

- Instruct the client to store cowslip products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use cowslip in children or those who are pregnant or breastfeeding until more research is available.
- Inform the client that scientific research is lacking to support any of the uses for or actions of cowslip.

= Pregnancy = Pediatric = Alert = Popular Herb

Cranberry

(kran′beh-ree)

Scientific names: *Vaccinium macrocarpon, Vaccinium oxycoccus, Vaccinium erythrocarpum*

Other common names: Bog cranberry, isokarpalo, marsh apple, mountain cranberry, pikkukarpalo

Origin: Cranberry is a small shrub found in the United States, from Tennessee to Alaska.

Uses

Cranberry is used to prevent (but not to treat) urinary tract infections. It may be used to treat kidney stones.

Actions

Urinary Tract Action

Studies abound on the urinary tract action of cranberry. It is well known that cranberry juice is useful for the prevention of urinary tract infections (Jackson et al, 1997; Jepson et al, 2000; Lavigne et al, 2007). The increase in urine acidity causes a decrease in organism growth. However, cranberry juice is not effective for the treatment of urinary tract infections. Cranberry does decrease ionized calcium in urine by 50% and therefore may be used to treat recurrent kidney stones (Murray, Pizzorno, 1998).

Antioxidant Action

One study evaluated the antioxidant properties of blueberry and cranberry juice. Consumption of cranberry juice increased the ability of plasma to increase antioxidants. Blueberry juice did not exert this effect (Pedersen et al, 2000). However, this was a small study with only nine participants.

Cardiovascular Action

There is a growing body of evidence that the phenolic acids (benzoic, hydroxycinnamic, ellagic) in cranberries may contribute to reducing cardiovascular risk, including decreased platelet aggregation, reducing blood pressure, and increasing resistance of LDL to oxidation (McKay et al, 2007).

Oral Antiplaque Action

One study using a high-molecular-weight cranberry constituent found that the substance altered subgingival microbes and therefore would be able to control periodontal disease (Weiss et al, 1998).

Product Availability

Capsules, fresh berries, juice

Plant Part Used: Berries

Dosages

- Adult PO capsules: 9-15 capsules/day (400-500 mg each) (McCaleb et al, 2000)
- Adult PO capsules (powdered concentrate): 2 capsules daily
- Adult PO juice: 1-2 cups daily (Murray, Pizzorno, 1998)

Contraindications

Pregnancy category is 1; breastfeeding category is 2A.
Cranberry should not be used by persons with oliguria, anuria, or hypersensitivity to this herb.

Side Effects/Adverse Reactions

GI: Diarrhea (large doses)
INTEG: Hypersensitivity reactions

Interactions

Drug

Cytochrome P45 2C9 substrates: Cranberry may inhibit cytochrome P45 2C9 enzymes.
Warfarin: Cranberry, when given with warfarin, may increase the international normalized ratio and increase the risk for bleeding.

Lab Test

Urine pH: Cranberry decreases urine pH.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Phenolic Acid	Benzoic acid; Ellagic, hydroxycinnamic	Decreased CV risk
	Malic acid; Citric acid; Quinic acid	
Carbohydrate	Oligosaccharides	Antimicrobial
	Fructose	
Anthocyanin		
Proanthocyanidins		Antimicrobial
Flavonoids	Quercetin; Myricetin	
Glycosides	Epicatechin; Catechin	

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue use of cranberry and administer an antihistamine or other appropriate therapy.
- Assess the client's genitourinary status: urinary frequency, hesitancy, pain, or burning. If a urinary tract infection is present, refer the client for antibiotic therapy.

Administer

- Instruct the client to store cranberry products away from light and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 1 and breastfeeding category is 2A.
- Caution the client not to use cranberry in place of antibiotic therapy if urinary frequency, hesitancy, pain, or burning are present.
- Advise the client that cranberry is effective for preventing urinary tract infections but not for treating them.

Creatine

(kree′uh-teen)

Origin: Creatine is an amino acid that occurs naturally in dairy products, seafood, and beef. It is manufactured by the body in the liver, kidney, and pancreas.

Uses

Creatine is used for gyrate atrophy, McArdle's disease, muscular dystrophy, amyotrophic lateral sclerosis, and rheumatoid arthritis. It is used in congestive heart disease to improve exercise tolerance and to enhance athletic performance.

Actions

Exercise Performance Enhancement

A group of athletes was evaluated for increased muscle strength after creatine supplementation. Measures used to determine muscle strength included knee extensor torque and ammonia and lactate levels. The study concluded that creatine supplementation increased muscle strength (Greenhaff et al, 1993).

Cardiovascular Action

One study focused on the effects of dietary creatine supplementation in patients with congestive heart failure. Muscle metabolism was measured using a cannula inserted into an antecubital vein. Maximum voluntary contraction was also measured. Researchers drew the participants' blood at rest and at 2 minutes after exercise to compare measurements of lactate and ammonia buildup. Results indicated increased muscle contractions. Researchers concluded that creatine supplementation increased skeletal muscle endurance and lessened abnormal skeletal muscle metabolic response to exercise (Andrews et al, 1998).

Neuroprotective Action

Creatine supplementation increases partial neuroprotection against 3-NP–induced toxicity. The data suggest that creatine may play a role in the development of spinal cord neurons (Ducray et al, 2007). Another use may be in Parkinson's disease. Creatine is a neuroprotective factor in developing nigral dopaminergic neurons (Andres, 2005).

Product Availability

Powder, tablets

Dosages

Different dosages are reported.

- Adult PO normal dietary dose: 2 g/day

To Enhance Athletic Performance

- Adult PO: loading dose 20 g/day × 5 days, then 2 or more g/day

Congestive Heart Failure

- Adult PO: 20 g/day × 5-10 days (Jellin et al, 2008)

Gyrate Atrophy

- Adult PO: 1.5 g/day (Jellin et al, 2008)

Muscular Dystrophy

- Adult PO: 10 g/day

Amyotrophic Lateral Sclerosis

- Adult PO: 10 g per day × 12-16 mo (Jellin et al, 2008)

McArdle Disease

- Adult PO: 150 mg/kg daily × 5 days, then 60 mg/kg daily (Jellin et al, 2008)

Muscular Dystrophy

- Child PO: 5 g/day (Jellin et al, 2008)

Contraindications

Until more research is available, creatine supplements should not be used during pregnancy and breastfeeding. They should not be given to children. Creatine supplementation is not recommended for persons with renal or cardiac disease.

Side Effects/Adverse Reactions

GI: Nausea, anorexia, bloating, weight gain, diarrhea
SYST: Dehydration, cramping (high doses)

Interactions

Drug

Glucose: Increased glucose intake may increase the storage of creatine in muscle tissue.
Nephrotoxics *(aminoglycosides, NSAIDs, cyclosporine, and others):* Use of these agents and creatine may lead to nephrotoxicity.

Herb

Caffeine, ephedra: Increased caffeine intake may decrease the effects of creatine.

Food

Carbohydrates: When creatine is combined with carbohydrates, creatine levels are increased significantly (Jellin et al, 2008).

Lab Test

Serum creatinine: Creatine may lead to increased creatinine levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Amino acid	Arginine (precursors)	Enhancement of exercise endurance
	Glycine (precursors)	

Client Considerations

Assess

- Assess for signs of abuse in athletes; creatine is used as a performance enhancer.
- Assess for use of caffeine, ephedra, glucose, and nephrotoxics (see Interactions).

Administer

- Instruct the client to store creatine products in a sealed container in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use creatine supplements in children or those who are pregnant or breastfeeding until more research is available.
- Advise the client not to use creatine to treat renal or cardiovascular disease. Research on the cardiovascular action of creatine is inconclusive.

= Pregnancy = Pediatric = Alert = Popular Herb

- Inform the client that creatine has been used to increase endurance during intense exercise sessions lasting less than 1 hour.
- Caution the client that the effects of long-term creatine supplementation are unknown.

Cucumber

(kyew-kuhm-bur)

Scientific name: *Cucumis sativus*

Other common names: Wild cucumber, cow cucumber

Origin: Cucumber is a vegetable found in India.

Uses

In traditional herbal medicine, cucumber is used as a diuretic and to treat both hypertension and hypotension. It is used topically to soothe irritated skin. The cucumber seeds may possess anthelmintic properties. Wild cucumber is not the same as cucumber available in grocery stores.

Actions

Very little research has been done on wild cucumber. It has been used as a mild diuretic for many years (Duke, 2003). The diuretic action may be due to cucurbitin, a glycoside. However, all of the available information on its uses comes from traditional herbal medicine and is not based on scientific research. Many studies have been done from a botanical rather than a medicinal perspective.

Product Availability

Juice; seeds; shampoo, conditioner, and cosmetics with cucumber as a component

Plant Parts Used: Fruit, seeds

Dosages

- Adult PO ground seeds: 1-2 oz prepared as a decoction steeped in water
- Adult topical: apply prn

Contraindications

Until more research is available, cucumber should not be used during pregnancy and breastfeeding. It should not be given to children. Cucumber products should not be used by persons with hypersensitivity to this herb.

Side Effects/Adverse Reactions

GI: Heartburn, belching (fruits)
META: Electrolyte/fluid imbalance

Interactions

Drug

Diuretics: Cucumber may increase the diuretic effect of other diuretics; avoid concurrent use.

Lab Test

Potassium: Cucumber may decrease potassium levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Fatty acid **Glycoside** **Resin**	Cucurbitin	Mild diuretic

Client Considerations

Assess

- Determine how much cucumber the client is using. The seeds should not be used in amounts greater than the recommended dose.
- Assess for the use of diuretics (see Interactions).

Administer

- Instruct the client to store cucumber products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use cucumber in children or those who are pregnant or breastfeeding until more research is available.

Daffodil

(da'fuh-dil)

Scientific name: *Narcissus pseudonarcissus*

Other common names: Daffydown-dilly, fleur de coucou, Lent lily, narcissus, porillon

Origin: Daffodil is a flowering plant found in Europe and the United States.

Uses

Daffodil is taken internally as an emetic and as a treatment for respiratory conditions such as congestion. It is used topically to relieve joint inflammation and pain and to treat burns and wounds.

Actions

Anti-HIV Action

Two studies evaluated the anti-HIV action of daffodil (Weiler et al, 1990; Balzarini et al, 1991). The Weiler study determined that the polysaccharide component, sulphoevernan, binds to the virus rather than to the host cell. Similarly, the Balzarini study showed that a lectin component, NPA, also binds to the virus rather than to the host cell.

Anticancer Action

One study (Wang et al, 2000) focused on the effects of the lectins on differing carbohydrate-binding when daffodil is used to treat human hepatoma, human choriocarcinoma, mouse melanoma, and rat osteosarcoma. The lectins may be toxic to these cancers. The results showed *Narcissus pseudonarcissus* to be only mildly cytotoxic.

Product Availability

Extract, powder

Plant Parts Used: Bulb, flowers, leaves

Dosages

Different dosages are reported.

Emetic

- Adult PO extract: 3 grains

Joint Pain, Inflammation, Wound Healing

- Adult topical: Apply prn

Respiratory Conditions

- Adult PO powder: 20 grains-2 drams

Contraindications

Daffodil should not be used during pregnancy and breastfeeding. It should not be given to children. Persons who are hypersensitive to daffodil should not use it. Daffodil bulbs and flowers should not be consumed. Serious and even fatal reactions can occur from flower and bulb consumption.

Side Effects/Adverse Reactions

CNS: Paralysis, paresthesia, chills
CV: *Cardiovascular collapse (bulbs)*
EENT: Swelling of mouth, throat, tongue

Continued

Side Effects/Adverse Reactions—cont'd

GI: Nausea, vomiting, anorexia, salivation
INTEG: Hypersensitivity reactions, contact dermatitis, daffodil itch
RESP: *Respiratory collapse* (bulbs)

Interactions

Herb

Mineral supplements *(calcium, iron, zinc):* Daffodil may decrease mineral absorption from mineral supplements (Jellin et al, 2008).

Food

Minerals in foods *(calcium, iron, zinc):* Daffodil may decrease mineral absorption from food (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid	Narcissine	Emetic
	Lectin agglutinin (NPA)	Anti-HIV
	Masonin; Homolycorin; Hemanthamine; Galanthine; Galanthamine; Anticholinesterase, Analgesic; Pluviine; Lycorine	
Acid	Chelidonic acid	
Polysaccharide	Sulphoevernan	Anti-HIV

Client Considerations

Assess

- Assess the reason the client is using daffodil.
- Assess for hypersensitivity reactions, contact dermatitis, and daffodil itch. If these are present, discontinue the use of daffodil and administer an antihistamine or other appropriate therapy.
- Assess for consumption of bulbs and flowers. Serious and even fatal reactions can occur.

Administer

- Instruct the client to avoid any use of daffodil products unless supervised by a qualified herbalist.

Teach Client/Family

- Caution the client not to use daffodil in children or those who are pregnant or breastfeeding until more research is available.
- Strongly caution the client not to consume daffodil bulbs or flowers. Serious and even fatal reactions can occur.

Daisy

(day'zee)

Scientific name: *Bellis perennis*

Other common names: Bairnwort, bruisewort, common daisy, day's eye, pansy, wild daisy

Origin: Daisy is a perennial found throughout the world.

Uses

Daisy is used as a pain reliever and to treat diarrhea, cough, and gastrointestinal spasms. It is also used to relieve arthritis joint pain and inflammation, and as a blood purifier and an antifungal.

Actions

Very little scientific research is available on daisy. Most of the research has focused on identifying its chemical components, which had not been studied previously.

Antimicrobial Action

One study revealed that the triterpenoid glycoside components of *Bellis perennis* L. are responsible for its antifungal activity. In this study these glycosides were effective against human pathogenic yeasts such as *Candida* and *Cryptococcus* spp. (Bader et al, 1990). Another study evaluated the essential oils of daisy for potential antimicrobial activity. Two of the oils exhibited activity against both gram-positive and gram-negative bacteria (Avato et al, 1997).

Other Actions

The volatile oil, thujone, may be responsible for increased salivation and blood flow and may be mind altering. Daisy may reduce postpartation bleeding as measured by Hgb at 72 hr after delivery (Oberbaum et al, 2005) and may decrease triglycerides (Morikawa, 2008).

Product Availability

None available commercially

Plant Parts Used: Flowers, leaves

Dosages

- Adult PO infusion: 1 tsp dried flowers steeped 20 min in 1 cup boiling water, drink 2-4 cups bid-qid
- Adult PO tincture: 3-4 ml taken bid-tid
- Adult topical: apply a poultice of pressed leaves prn to affected area

Contraindications

Until more research is available, daisy should not be used during pregnancy and breastfeeding. It should not be given to children.

Interactions

Drug

Alcohol: Daisy may increase the effect of alcohol (Jellin et al, 2008).

Herb

Thujone-containing herbs *(cedar, oak moss, sage, tree moss, wormwood):* Daisy, when used with these herbs, can lead to thujone toxicity (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Saponin	Polygalacteronic acid	
Tannin		Astringent
Organic acid		
Mucilage		
Essential oil		Antibacterial, antifungal
Triterpenoid glycoside	Isohamnetin; Kaemferol	Antifungal
Flavonol		
Glycosides		
Volatile oil	Thujone	Salivation, blood flow, mind altering
Perennisaponins	A, B, C, D, E, F (Yoshikawa, 2008)	

Client Considerations

Assess

- Determine why the client is using daisy and suggest other alternatives.

Administer

- Instruct the client to store daisy in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use daisy in children or those who are pregnant or breast-feeding until more research is available.

Damiana

(dah-mee'ah-nah)

Scientific name: *Turnera diffusa*

Other common names: Herba de la pastora, Mexican damiana, old woman's broom, rosemary

Origin: Damiana is a shrub found in the United States and in Central and South America.

Uses

Damiana is used as an aphrodisiac to increase sexual potency. It may irritate the urethra and increase sensitivity of the penis. Damiana may be used in combination with other herbs for sexual potency. This herb is also used as a diuretic, antidepressant, laxative, and antianxiety agent, and it is thought to produce euphoric effects when smoked.

Investigational Uses

Damiana shows promise as an antidiabetic agent (Alarcon-Aguilar et al, 2002) and as a weight-loss agent.

Actions

Very little research is available for damiana. Two small studies have been done since 1998. One focused on the antihyperglycemic effects of damiana, testing 28 different plant species to determine their antidiabetic effects. One herb that was found to be an effective antihyperglycemic was *Turnera diffusa* (Alarcon-Aguilar et al, 1998; Alarcon-Aguilar et al, 2002). Another study focused on the role of damiana in increasing the sexual behavior of male rats. This study seems to support the traditional use of *Turnera diffusa* as a sexual stimulant (Arletti et al, 1999). Aphrodisiac action may be due to an alkaloid present that acts like the male hormone testosterone.

Product Availability

Capsules, powder, tea, tincture

Plant Part Used: Leaves

Dosages

- Adult PO decoction: 18 g powder/500 ml water tid
- Adult PO tea: 1 cup tid (Murray, Pizzorno, 1998)
- Adult PO liquid extract: 2-4 ml (Jellin et al, 2008)
- Adult PO tincture: 2.5 ml tid
- Adult PO dried leaf: 2-4 g tid (Jellin et al, 2008)

Contraindications

Pregnancy category is 3; breastfeeding category is 1A.

Damiana should not be given to children. It should not be used by persons with hepatic disease, diabetes, or hypersensitivity to this herb.

Side Effects/Adverse Reactions

CNS: Hallucinations, confusion, headache, insomnia

GI: Nausea, vomiting, anorexia, *hepatotoxicity (high doses)*

GU: Urethral irritation

INTEG: Hypersensitivity reactions

Interactions

Drug

Antidiabetics: Damiana may decrease the action of antidiabetics.

Lab Test

ALT, AST, alkaline phosphatase: Damiana may increase these levels.

Blood glucose: Damiana may decrease blood glucose levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Phenolics **Saccharides** **Terpenoids** (Zhao et al, 2007)		
Volatile oil	Cineol	Choleretic; antibacterial
	Pinenes; Cymene	
Thymol		
Sesquiterpene		
Glycoside	Cyanogenic; Arbutin	
Resin		
Tannin		Wound healing
Mucilage		
Gum		
Quinone	Arbutin	Antibacterial
Alkaloid		Testosterone-like action

Client Considerations

Assess

- Assess the reason the client is using damiana.
- Assess for hypersensitivity reactions. If present, discontinue use of damiana and administer an antihistamine or other appropriate therapy.
- Assess for hepatotoxicity: increasing ALT, AST, and bilirubin levels; clay-colored stools; right upper-quadrant pain. If hepatotoxicity occurs, use of herb should be discontinued and appropriate action taken.

Administer

- Instruct the client to store damiana products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 1A.
- Caution the client not to give damiana to children.

Dandelion

(dan'duh-ly-uhn)

Scientific names: *Taraxacum officinale, Taraxacum laevigatum*

Other common names: Blowball, cankerwort, lion's tooth, priest's crown, puffball, swine snout, white endive, wild endive

Origin: Dandelion is a weed found throughout the world. It is cultivated in parts of Europe.

= Pregnancy = Pediatric = Alert = Popular Herb

Uses

Dandelion has been used as a laxative, an antihypertensive, a digestive aid, and a diuretic. It may also be used to remove toxins.

Investigational Uses

Dandelion is used experimentally as an antitumor agent and immunogenic and to treat chronic colitis. Dandelion has also been used to treat urolithiasis. However, other pharmacologic treatments are just as effective (Grases et al, 1994).

Actions

Antitumor/Immunogenic Action

One Chinese study evaluated immunomodulators used to restore suppressed immune functions in scald mice, including cell-mediated, humoral, and nonspecific immunity. The control group of scald mice all showed depressed immune function. *Taraxacum officinale* exhibited immunomodulating effects, with the effects directly related to the dose (Luo, 1993). Another study focused on nitric oxide production, which is an indicator of immune regulation and defense. *T. officinale* restored the ability of mouse peritoneal macrophages to inhibit nitric oxide production. The secretion of tumor necrosis factor-alpha is responsible for this effect (Kim et al, 1998). A new study (Sigstedt et al, 2008) used an extract of dandelion and showed a decreased growth of breast and prostate cancer and that dandelion may be of value as a novel anti-cancer agent.

Anticolitic Action

One study documents the efficacy of *T. officinale* when used in combination with other herbs for the treatment of chronic colitis. Twenty-four patients with chronic nonspecific colitis were given an herbal combination of *T. officinale, Hypericum perforatum, Melissa officinalis, Calendula officinalis,* and *Foeniculum vulgare.* After 15 days of treatment, defecation occurred only once daily, and diarrhea was normalized in patients with diarrhea syndrome (Chakurski et al, 1981).

Other Actions

One of the traditional uses of *T. officinale* has been to treat urolithiasis. In one study the herb improved citraturia, calciuria, phosphaturia, urine pH, and diuresis. Its urolithiatic action is believed to result from its saponin components (Grases et al, 1994). However, other products that work equally well are available to treat urolithiasis. Another study (Jeon, 2008) identified dandelion antiinflammatory (COX-2) action.

Product Availability

Capsule, fluid extract, fresh plant, juice, solid extract, tea, tincture

Plant Parts Used: Flowers, leaves, roots

Dosages

- Adult PO decoction: 2-8 g dried root in 150 ml boiling water, let stand 15 min, tid
- Adult PO fluid extract: 4-10 ml (1:1 in alcohol 25%) tid (Blumenthal, 1998)
- Adult PO infusion: 4-10 g dried leaves in 8 oz water tid
- Adult PO infusion: 2-8 g dried root in 8 oz water tid
- Adult PO juice: 4-8 ml tid
- Adult PO tincture: 5-10 ml (1:5 in alcohol 45%) tid
- Adult PO whole herb: 4-10 g herb tid (Blumenthal, 1998)
- Child PO root infusion: ¼-1 cup/day several times/wk (Romm, 2000)
- Child topical root tincture: ¼-1 tsp bid (Romm, 2000)

Contraindications

Pregnancy category is 3; breastfeeding category is 2A.
Dandelion should not be used by persons with hypersensitivity to this product or other *Asteraceae* spp. (chamomile, yarrow root) and should be used cautiously by persons with diabetes mellitus, fluid and electrolyte imbalances, hypertension, or congestive heart failure. Persons with irritable bowel syndrome, digestive diseases, bile duct obstruction, intestinal obstruction, or latex allergy should avoid the use of this herb.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, cholelithiasis, gallbladder inflammation
INTEG: Hypersensitivity reactions, contact dermatitis

Interactions

Drug

Antacids, H_2-blockers, proton pump inhibitors: Dandelion may decrease the action of these drugs (Jellin et al, 2008).
Anticoagulants, antiplatelets, NSAIDs, salicylates: Dandelion may increase bleeding when used with these products.
Antihypertensives, insulin, antidiabetics: Dandelion may increase the effects of antihypertensives, insulin, antidiabetics; avoid concurrent use.
Diuretics: Dandelion may increase diuresis when used concurrently with diuretics, leading to fluid loss and electrolyte imbalances; avoid concurrent use.
Lithium: Toxicity may occur as a result of sodium excretion if dandelion is used concurrently with lithium.

Herb

Diuretic herbs *(agrimony, artichoke, broom, buchu, burdock, celery, cornsilk, couchgrass, elder, juniper, pokeroot, shepherd's purse, squill, uva ursi, yarrow):* Dandelion may increase diuretic action of the other diuretic herbs (Jellin et al, 2008).
Hypoglycemic herbs: Dandelion may increase hypoglycemia when used with hypoglycemic herbs (Jellin et al, 2008).

Lab Test

AST, ALT, alkaline phosphatase, APTT, INR, PT: Dandelion may increase these levels.
Blood glucose: Dandelion may decrease blood glucose levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Acid	Caffeic acid; Chlorogenic acid	Antitumor; analgesic
	Linoleic acid	Antiarteriosclerotic
	Oleic acid	Antiinflammatory; antitumor
	Palmitic acid	Antifibrinolytic

= Pregnancy = Pediatric = Alert = Popular Herb

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
	Linolenic; Chicoric; Monocaffeyltartaric; Taraxacin; Taraxacum	
Coumarin	Cichoriin; Aesculin	Anticoagulant
Flavonoid	Luteolin; Chrysoeriol	
Mineral		
Resin		
Taraxasterol		Antiinflammatory
Taraxerin		Increases digestion
Taraxerol		
Taraxalisin		
Terpenoid		
Vitamin	A; B; C; D	
Carotenoid		
Glycosides		
Sesquiterpene lactones	Dihydroconiferin; Syringin; Dihydrosyringin; 11beta; 13-Dihydrolactucin; Ixerin D; Ainslioside	Allergic reactions, diuretic
Saponins		Urolithiatic
Inulin		Hypoglycemic

Client Considerations

Assess

- Assess the reason the client is using dandelion.
- Assess for hypersensitivity reactions and contact dermatitis. If either of these is present, discontinue use of dandelion and administer an antihistamine or other appropriate therapy. Also, assess for hypersensitivity to other *Asteraceae* spp.
- Identify the use of antihypertensives, diuretics, antidiabetics, insulin, and lithium. Use of dandelion should be avoided if the client is taking these medications (see Interactions).
- Assess for fluid and electrolyte imbalances: check sodium chloride and potassium chloride levels.
- Assess blood pressure if the client is combining dandelion with antihypertensives.
- Assess blood glucose in the diabetic patient who is taking insulin or oral antidiabetes agents.

Administer

- Instruct the client to store dandelion products away from moisture and light.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 2A.
- Caution clients with children taking diabetic medications not to use dandelion until approved by prescriber.
- Inform the client that dandelion may cause increased diuresis and that fluid and electrolyte imbalances may result.

Devil's Claw

(dev'uhlz claw)

Scientific name: *Harpagophytum procumbens*

Other common names: Grapple plant, wood spider

Origin: Devil's claw grows wild in southwest Africa.

Uses

Devil's claw is used to increase the appetite and to treat joint pain and inflammation, arthritis, allergies, headache, heartburn, dysmenorrhea, gastrointestinal upset, malaria, gout, and nicotine poisoning.

Actions

Antiinflammatory Action

Several studies have evaluated the antiinflammatory properties of devil's claw in the treatment of joint conditions. The results are mixed. One Canadian study (Whitehouse et al, 1983) evaluated *Harpagophytum procumbens* for reduction of rat hindfoot edema. Devil's claw was completely ineffective, even at doses greater than 100 times the recommended human dose. Another study produced similar results. No clinical significance was found when human subjects consumed devil's claw (Moussard et al, 1992). Another study (Baghdikian et al, 1997) reported conflicting results on harpagoside, one of the chemical components of the herb, which showed analgesic and antiinflammatory properties. *H. procumbens* was found to produce analgesic and antiinflammatory effects (Chantre et al, 2000; Fiebich et al, 2001; Gobel et al, 2000). Another study determined that the iridoid glycosides are responsible for the analgesic, antiinflammatory, and antiphlogistic effects of devil's claw (Wegener, 1999). Devil's claw possesses analgesic, antiinflammatory, and hypoglycemic properties as suggested in folklore (Mahomed, 2004).

Cardiovascular Action

When rats and rabbits were studied to determine the cardiovascular effects of *H. procumbens,* a significant dose-dependent reduction occurred in arterial blood pressure, along with a reduction in heart rate at high doses. Harpagoside, one of the chemical components of the herb, exhibited less activity than did the extract of *H. procumbens.* The extract of *H. procumbens* produced a mild decrease in heart rate, with mild positive inotropic effects at low doses but a significant negative inotropic effect at higher doses. Harpagoside showed negative chronotropic and positive inotropic effects (Circosta et al, 1984). Another study demonstrated that devil's claw exerts a protective action in hyperkinetic ventricular arrhythmias in rats (Costa De Pasquale et al, 1985).

Other Actions

Devil's claw depresses the central nervous system and may be used as an anticoagulant as described in folklore (Mahomed, 2006).

Product Availability

Capsules, dried powdered root, dry solid extract, tea, tincture

Plant Parts Used: Roots, tubers

Dosages

Anorexia

- Adult PO infusion: 1.5 g herb tid (Blumenthal, 1998)

Gout
- Adult PO dried powdered root: 1-2 g tid (Murray, Pizzorno, 1998)
- Adult PO tincture: 4-5 ml (1:5 dilution) tid (Murray, Pizzorno, 1998)
- Adult PO dry solid extract: 400 mg tid (Murray, Pizzorno, 1998)

Osteoarthritis
- Adult PO dried powdered root: 1-2 g tid (Murray, Pizzorno, 1998)
- Adult PO tincture: 4-5 ml (1:5 dilution) tid (Murray, Pizzorno, 1998)
- Adult PO dry solid extract: 400 mg tid (Murray, Pizzorno, 1998)

Other
- Adult PO infusion: ≤4.5 g herb (Blumenthal, 1998) in 300 ml boiling water, let stand 8 hr, strain and drink

Contraindications
Pregnancy category is 3; breastfeeding category is 2A.
Until more research is available, this herb should not be given to children. Persons with peptic or duodenal ulcer disease, cholecystitis, or hypersensitivity to this herb should avoid the use of devil's claw.

Side Effects/Adverse Reactions
CNS: Headache
CV: Hypotension
EENT: Tinnitus
GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions

Interactions
Drug
Antacids, H_2-blockers, proton pump inhibitors: Devil's claw may decrease the action of these agents (Jellin et al, 2008).
Antiarrhythmics, antihypertensives: Because two of the chemical components in devil's claw exert inotropic and chronotropic effects, use this herb cautiously with antiarrhythmics and antihypertensives (theoretical).
Antidiabetics: Devil's claw may cause an additive effect with antidiabetics (Jellin et al, 2008).
Warfarin: Devil's claw taken with warfarin may cause risk of bleeding (Jellin et al, 2008).
Lab Test
APTT, PT: Devil's claw may increase these levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Triterpene		
Resin		
Flavonoid	Kaempferol; Luteolin	

Continued

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Iridoid glycosides	Harpagoside; Harpagide	Negative chronotropic; positive inotropic, antiinflammatory
	Procumbide	
Stigmasterol		
Beta sitosterol		
Fatty acid		
Phenylethanols	Acetoside, isoacetoside	

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue use of devil's claw and administer antihistamine or other appropriate therapy.
- Assess cardiac status in any client with a cardiac condition: blood pressure, character of pulse.
- Identify what prescription drugs and herbal supplements the client is taking to treat this condition (see Interactions).
- Assess joint pain and inflammation in any client with an arthritic condition: pain location, duration, intensity, and alleviating and aggravating factors.

Administer

- Instruct the client to store devil's claw products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 2A.
- Caution the client not to use devil's claw in children until more research is available.

DHEA

Scientific name: Dehydroepiandrosterone

Origin: DHEA is naturally occurring in yam (see Wild Yam, p. 596-597).

Uses

DHEA may be used to stimulate immunity and to treat atherosclerosis, hyperglycemia, and cancer. It is also used to prevent osteoporosis and to improve memory and cognitive functioning in Alzheimer's disease. However, the use of DHEA for cognitive functioning has been withdrawn (Huppert et al, 2006). DHEA may be effective for adrenal insufficiency, erectile dysfunction, and schizophrenia.

Investigational Uses

Research is underway to determine the efficacy of DHEA used by postmenopausal women in place of traditional hormone replacement therapy. DHEA may also reduce symptoms of depression, aging, asthma, rheumatoid arthritis, and lupus erythematosus.

Actions

Hormonal Action

In the human body, DHEA is synthesized from a precursor steroid, pregnenolone, and then is converted into estrogens and testosterone in men and women (Baulieu et al, 1996). Reports confirm that levels of DHEA decline significantly after age 40. Some researchers suspect that this decline may be associated with insulin resistance, increased weight gain, and cardiovascular conditions (Sahelian, 1997). DHEA may provide an alternative to hormone replacement therapy in women (Takayanagi et al, 2002). However, supplementation should not be started before the client undergoes a thorough evaluation for hormone-sensitive tumors.

Cancer Stimulation/Cancer Inhibition

Conflicting studies have reported increased tumor flare in patients with prostate cancer. However, initiation of antihormone therapy caused the flare to retreat (Jones et al, 1997).

Cardiovascular Action

One study evaluated levels of DHEA in patients with congestive heart failure. The results showed that levels of DHEA are lower in patients with congestive heart failure, in proportion to the severity of the disease (Moriyama et al, 2000).

Immunoregulation Action

One study (Cheng et al, 2000) evaluated the effect of DHEA and DHEA sulfate on interleukin-10 (IL-10) in laboratory mice. The results indicated that DHEA and DHEA sulfate increase IL-10, and DHEA may also affect the functioning of B-lymphocytes.

Cognitive Function Action

In one study, DHEA levels were found to be significantly lower in patients with Alzheimer's disease and vascular dementia than in patients who did not have these diseases. Cortisol levels were found to be significantly higher. The usefulness of this information has not yet been determined (Bernardi et al, 2000). New information suggests that DHEA does nothing to stimulate cognitive functioning (Huppert et al, 2006).

Product Availability

Capsules, cream, tablets

Dosages

Rheumatoid Arthritis

- Adult PO: 50-200 mg/day (Murray, Pizzorno, 1998)

Supplementation

- Adult PO men >50 yr of age: 25-50 mg/day (Murray, Pizzorno, 1998)
- Adult PO women >50 yr of age: 15-25 mg/day (Murray, Pizzorno, 1998)
- Adult PO men and women >70 yr of age: 50-100 mg/day (Murray, Pizzorno, 1998)

Vaginal

- Adult PO topical: 10% cream applied daily (Jellin et al, 2008)

Contraindications

Until more research is available, DHEA should not be used during pregnancy and breastfeeding. It should not be given to children. Persons with estrogen-sensitive tumors (such as breast or uterine cancer), prostate cancer, or benign prostatic hypertrophy should not use this product.

Continued

Side Effects/Adverse Reactions

CNS: Insomnia, restlessness, irritability, anxiety, increased mood, aggressiveness
CV: Irregular heart rhythm (high doses)
INTEG: Acne

Interactions

Drug

Anastrozole, exemestane, fulvestrant, letrozole, tamoxifen: DHEA is a potent estrogen agonist; do not use DHEA with these agents (Jellin et al, 2008).
Corticosteroids: DHEA levels are decreased by corticosteroids (Jellin et al, 2008).
Cytochrome P450 3A4 substrates: DHEA may decrease the action of drugs metabolized by P450 3A4 enzyme (Jellin et al, 2008).
Hormone replacement therapy: DHEA may interfere with estrogen and androgen therapy; avoid concurrent use (theoretical).

Client Considerations

Assess

- Assess the reason the client is using DHEA.
- Assess for changes in mood and inability to sleep. Watch for increasing aggressiveness, irritability, and restlessness.
- Determine whether the client is currently using hormone replacement therapy; if so, use of DHEA should be avoided (see Interactions).
- Assess for hormone-sensitive tumors; DHEA may stimulate the growth of these tumors.

Administer

- Instruct the client to store DHEA in a sealed container away from moisture and light.

Teach Client/Family

- Caution the client not to use DHEA in children or those who are pregnant or breastfeeding until more research is available.
- Advise the client to lower the dosage of DHEA if acne develops.

Dill

(dil)

Scientific name: *Anethum graveolens*

Other common names: Dill seed, dillweed, garden dill, dilly

Origin: Dill is found throughout the world.

Uses

In traditional herbal medicine, dill is used to relieve flatulence and infant colic. It is also reported to exert antispasmodic effects.

Investigational Uses

Research is underway to confirm the uses of dill as an antihyperlipidemic and antihypercholesterolemic (Yazdanparest et al, 2001; Kojuri et al, 2007).

Actions

Very little research is available for *Anethum graveolens.* Primary research has focused on determining the chemical components of this herb. Other information has come from anecdotal reports and traditional uses.

Antimicrobial Action

One study evaluated the volatile oil of dill for antimicrobial activity. The volatile oil taken from mature plants exerted the highest antimicrobial effect. Unlike many other herbs, the geographic area in which the plant was grown did not change its antimicrobial effect. Dill inhibited the growth of both yeast and lactic acid bacteria (Shcherbanovsky et al, 1975; Stavri et al, 2005).

Other Actions

Rats were fed a diet high in cholesterol and fats. After feeding the rats a dill extract for 2 weeks, cholesterol was not reduced but triglycerides were reduced by 42% (Yazdanparast et al, 2001; Kojuri, 2007). Dill extracts were used on the female reproductive system, showing that dill can be used to regulate menstrual cycles in women with irregular periods (Monsefi et al, 2006).

Product Availability

Dried fruit, essential oil, water (concentrated and distilled)

Plant Parts Used: Flowers, fruit, seeds

Dosages

- Adult PO dried fruit: 1-4 g tid
- Adult PO essential oil: 0.05-2 ml tid, or 0.1-0.3 g daily (Blumenthal, 1998)
- Adult PO seeds: 3 g daily (Blumenthal, 1998)
- Adult PO water, concentrated: 0.2 ml tid
- Adult PO water, distilled: 2-4 ml tid

Contraindications

Class 1 herb (fruit).

Other than a food product, dill should not be used during pregnancy and breastfeeding. It should not be given to children except under the supervision of a qualified herbalist. Persons with a fluid or electrolyte imbalance and those with hypersensitivity to dill or other related spices should not use this herb.

Side Effects/Adverse Reactions

ENDO: May alter sodium balance

INTEG: Hypersensitivity reactions; photodermatitis (fruit)

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Furancoumarin Flavonoid	Quercetin; Kaempferol Glucuronide; Isohamnetin	Antiinflammatory

Continued

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Volatile oil	Eugenol; Anethole Anethofuran; Carvone; Limonene	Antioxidant
Xanthone		
Triterpene		
Glucopyranosides	Hydroxypipentone; hydroxygeraniol	
Beta-carotene		
Iron		
Potassium		
(Jellin et al, 2008)		

Client Considerations

Assess

- Assess the reason the client is using dill.
- Assess for hypersensitivity reactions and photodermatitis. If these are present, discontinue use of dill and administer an antihistamine or other appropriate therapy.
- Assess fluid and electrolytes in clients with known imbalances.

Administer

- Instruct the client to store dill products away from moisture and light.

Teach Client/Family

- Caution the client not to use dill in those who are pregnant or breastfeeding until more research is available.
- Caution the client not to give dill to children unless under the supervision of a qualified herbalist.

Dong Quai

Scientific name: *Angelica polymorpha* var. *sinensis*

Other common names: Chinese angelica, dang gui, dry-kuei, tanggwi, tang-kuei, toki, women's ginseng

Origin: Dong quai is a perennial found in Japan, China, and Korea.

Uses

Dong quai has been used extensively in many to treat the symptoms of menopause. It is also used to treat menstrual irregularities such as dysmenorrhea, premenstrual syndrome, and menorrhagia. Other uses include treatment for headache, neuralgia, herpes infections, and malaria. In traditional Chinese medicine, dong quai is used to treat vitiligo and anemia. Dong quai should not be confused with other *Angelica* spp.

Actions

Dong quai has been used since the sixth century as a blood and liver tonic. In Chinese medicine, it has been used to treat hormonal irregularities and anemia.

Hormonal Action

Research on the hormonal actions of dong quai shows conflicting results. One study showed no statistical difference between dong quai and a placebo in reducing menopausal symptoms (Hirata et al, 1997). During the 6-month study, participants took standardized capsules of 0.5 mg/kg of ferulic acid, one of the chemical components of dong quai, and were evaluated at 6, 12, and 24 weeks. Reported menopausal symptoms did not differ between the placebo group and the dong quai group. Researchers concluded that dong quai exerts no estrogenic effects and that it is not effective when used alone to treat menopausal symptoms. However, the herbal combination tokishakuyakusan, including peony, *Angelica,* alisma, and cnidium, increased progesterone secretion by means of its action in the corpora lutea (Usuki, 1991).

Other Actions

A study evaluating the effects of *Angelica sinensis* root on melanocyte proliferation showed no stimulation of melanocyte division. Instead, cell cytotoxicity resulted at higher doses (Raman et al, 1996). Other actions include decreased intraocular pressure, decreased blood pressure (Yoshihiro, 1985), decreased premature ventricular contractions (Zhuang, 1991), inhibition of platelet aggregation (Li et al, 1989), increased tumor necrosis factor (TNF) (Haranaka et al, 1985), and decreased atherosclerosis. Antiinflammatory and mild analgesic properties have also been reported.

Product Availability

Capsules, fluid extract, raw roots (powdered), tablets, tea, tincture; available in many combination products; not available as a standardized extract

Plant Part Used: Roots

Dosages

Symptoms of Menopause and Premenstrual Syndrome

- Adult PO fluid extract: 1 ml (¼ tsp) tid (Murray, Pizzorno, 1998)
- Adult PO powdered root: 1-2 g tid (Murray, Pizzorno, 1998)
- Adult PO tea: 1-2 g tid (Murray, Pizzorno, 1998)
- Adult PO tincture: 4 ml (1 tsp) (1:5 dilution) tid (Murray, Pizzorno, 1998)

Other

- Adult PO capsules/tablets: 500 mg ≤6 times/day (Foster, 1998)
- Adult PO raw root: 1 g/day
- Adult PO tea: 1 cup bid-tid (Foster, 1998)
- Adult PO tincture: 5-20 drops (1:5 concentration) ≤ tid (Foster, 1998)

Contraindications

Class 2b herb (root).

Pregnancy category is 5; breastfeeding category is 2A.

Until more research is available, dong quai should not be given to children. In Chinese medicine, dong quai has been used during pregnancy, but its use must be monitored by a qualified herbalist. This herb should not be used by persons who are hypersensitive to it, or by those with bleeding disorders, excessive menstrual flow, or acute illness.

Continued

Side Effects/Adverse Reactions

GI: Nausea, vomiting, diarrhea, anorexia
GU: Increased menstrual flow
INTEG: Hypersensitivity reactions, photosensitivity
SYST: Fever, bleeding, cancer

Interactions

Drug

Anticoagulants** (anisindione, dicumarol, warfarin), **antiplatelets, estrogens, hormonal contraceptives: Dong quai may increase the effects of anticoagulants, antiplatelets, estrogens, hormonal contraceptives.

Herb

Chamomile, dandelion, horse chestnut, red clover: Dong quai may potentiate anticoagulant activity.
St. John's wort: Dong quai may increase photosensitivity (theoretical).

Lab Test

APTT, prothrombin time (PT), international normalized ratio (INR): Dong quai may increase levels of APTT, PT, INR (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil	Safrole	Carcinogenic
	n-Butylphthalide; Ligustilide	Relaxes bronchial smooth muscles
	Carinene; Isosafrole; Carvacrol; Succinic acid; Nicotinic acid; Uracil	
Vitamin	B_{12}	
Coumarin	Osthole	Anticoagulant, antispasmodic, vasodilator
	Psoralen; Bergapten; Imperatorin; Oxypeucedanin	
Furocoumadin	Angelicole; Demethylsuberosin	Anticoagulant, antispasmodic, vasodilator
Ferulic acid		Anticoagulant; decreased uterine movement
Polysaccharide		Immunostimulation

Client Considerations

Assess

- Assess the reason the client is using dong quai.
- Assess for hypersensitivity reactions. If present, discontinue use of dong quai and administer an antihistamine or other appropriate therapy.
- Determine whether the client is using anticoagulants; dong quai may increase bleeding tendencies (see Interactions).

Administer

- Instruct the client to store dong quai products in a sealed container away from moisture and heat.

Teach Client/Family

- Inform the client that pregnancy category is 5 and breastfeeding category is 2A.
- Caution the client not to use dong quai in children until more research is available.
- Advise the client that photosensitivity may occur. Sunscreen or protective clothing should be worn in sunlight.

Echinacea

Scientific names: *Echinacea angustifolia, Echinacea pallida, Echinacea purpurea*

Other common names: American cone flower, black sampson, black susans, cock-up-hat, comb flower, coneflower, hedgehog, Indian head, Kansas snakeroot, Missouri snakeroot, purple coneflower, red sunflower, rudbeckia, sampson root, scurvy root, snakeroot

Origin: Echinacea is a perennial found in only three states: Missouri, Nebraska, and Kansas. It is cultivated in much of the world. Echinacea is a Native American remedy.

Uses

Echinacea is used internally, primarily as an immune stimulant and for immune support and as prophylaxis for colds, influenza, and other viral, fungal, and bacterial infections. It may be used topically to promote wound healing and to treat wounds, bruises, burns, scratches, and leg ulcers. Echinacea is more effective when taken at the onset or first signs of an illness, not after the illness is well-established.

Investigational Uses

Researchers are experimenting with the use of echinacea to stimulate the immune system of HIV/AIDS patients. It may also be used as a prophylaxis for colds or urinary tract infections.

Actions

Echinacea has been studied extensively and found to be effective in both the prevention and treatment of acute colds and upper respiratory tract infections. Native Americans have used this herb to treat various illnesses. For the past several years echinacea has been among a group of herbs accepted by practitioners of mainstream medicine.

Immunostimulant Action

Echinacea stimulates the nonspecific immune response via phagocytosis, which plays a major role in the immune response. It also stimulates T-lymphocytes (Wagner et al, 1981). One study has demonstrated that echinacea significantly increases the phagocytosis of red blood cells (Vomel, 1984). Another study showed that 4 weeks of treatment with echinacea pressed juice enhanced interleukin-6 (IL-6) production in response to strenuous exercise. This study suggests that prophylactic treatment with echinacea counteracts the immunosuppressive effects of strenuous exercise (Berg et al, 1998).

Antiinfective Action

Echinacea has been shown to inhibit streptococcal growth and tissue hyaluronidase and to stabilize hyaluronic acid (Busing, 1955). Hyaluronidase is found in pathogenic organisms. In recent years there has been a lot of controversy about echinacea's use in the common cold. Preparations vary widely and this could account for the differences in studies (Barrett et al, 2006). There is little information regarding echinacea's interactions or use by persons with autoimmune disease (Barnes et al, 2005).

Product Availability

Capsules, fluid extract, juice, solid (dry powdered) extract, sublingual tablets, tablets, tea, tincture

NOTE: Some extracts may be standardized to 4% to 5% echinacoside; others are standardized to phenolics.

Plant Parts Used: Rhizome, roots; depending on developmental stage of growth: flowers, juice from the stem, leaves, whole plant

Dosages

- Adult parenteral: Dose individualized to age of client and condition (NOTE: parenteral route not used in the United States; herb used parenterally in Germany)
- Adult PO capsules: 500 mg-1 g tid (McCaleb et al, 2000)
- Adult PO dried root: 0.5-1 g tid; can use as tea (Murray, Pizzorno, 1998)
- Adult PO fluid extract: 1-2 ml tid (1:1 dilution) mixed in a little water (Bradley, 1992); 2-4 ml tid (Murray, Pizzorno, 1998)
- Adult PO freeze dried plant: 325-650 mg tid (Murray, Pizzorno, 1998)
- Adult PO pressed juice: 6-9 ml daily in divided doses (25:1 dilution in 22% alcohol) (McCaleb et al, 2000)
- Adult PO solid (dry powdered) extract: 150-300 mg tid (6.5:1 dilution or 3.5% echinacoside) (Murray, Pizzorno, 1998)
- Adult PO tea: 2 tsp (4 g) powdered herb simmered 15 min in hot water.
- Adult PO tincture: 15-30 drops bid-qid or 30-60 drops bid (McCaleb et al, 2000); 2-4 ml tid (1:5 dilution) (Murray, Pizzorno, 1998); other references suggest q1-2hr when person is ill.

Acute Infections

- Child PO root tincture: ½-1 tsp up to q2hr (Romm, 2000)

Skin Infections

- Child topical tincture: 1 tbsp root/¼ cup water, use as topical rinse (Romm, 2000)

To Prevent Colds and Infections

- Child PO root tincture: ½ tsp bid (Romm, 2000)

Contraindications

Pregnancy category is 1; breastfeeding category is 2A.

Echinacea should not be given to children younger than 2 years of age. It should not be used by persons who have autoimmune diseases such as lupus erythematosus, multiple sclerosis, HIV/AIDS, or collagen disease or by those with tuberculosis or hypersensitivity to *Bellis* sp. or composite family herbs. Immunosuppression may occur after extended therapy with this herb; do not use for longer than 8 weeks without a 3-week rest period.

Side Effects/Adverse Reactions

GI: *Hepatotoxicity* (Chernecky, Berger, 2008)
INTEG: Hypersensitivity reactions
RESP: *Acute asthma attack*
SYST: *Anaphylaxis, angioedema*

Interactions

Drug

Cytochrome P4503A4 substrates: Echinacea may inhibit cytochrome P4503A4 enzymes (Jellin et al, 2008).

Continued

Interactions—cont'd

Econazole vaginal cream: The action of this cream may be decreased by echinacea; avoid concurrent use.

Immunomodulators *(azathioprine, basiliximab, cyclosporine, daclizumab, muromonab, mycophenolate, tacrolimus, protease inhibitors, corticosteroids):* Echinacea may decrease the effects of immunosuppressants, protease inhibitors, corticosteroids and should not be used immediately before, during, or after transplant surgery.

Lab Test

ALT, AST, lymphocyte counts *(Echinacea purpurea),* ***serum immunoglobulin E (IgE), blood erythrocyte sedimentation rate (ESR):*** Echinacea may increase these tests.

Sperm enzyme activity: High doses of echinacea interfere with sperm enzyme activity.

Pharmacology

Pharmacokinetics

Immunosuppression is thought to occur after extended therapy with echinacea.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Phenylpropenoid	Echinacoside glycosides	Antimicrobial
	Caffaric acid	Antioxidant
	Chicoric acid; Aynarine	
Alkylamide	Tartaric acid	Inhibits arachidonic metabolism
Alkaloid	Tussilagine; Isotussilagine; Tetraen acid; Isobutylamide	
Polysaccharide	Inulin	Antiinflammatory; antiviral; immune stimulation
	Heteroxylin; Arabinorhamno-galactans; Fructose	
Essential oil	Palmitic; Linolenic	
Glycoproteins		
Flavonoid	Rutin	Antioxidant
Echinacin		Increases lymphocyte counts

Client Considerations

Assess

- Assess for hypersensitivity reactions to this herb, members of the daisy family (genus *Bellis*) or composite family herbs. If hypersensitivity is present, discontinue the use of this herb and administer an antihistamine or other appropriate therapy.

- Assess for use of econazole vaginal cream, immunomodulators, cytochrome P4503A4 substrates, protease inhibitors, and corticosteroids (see Interactions).

Administer

- Instruct the client to store echinacea products in sealed container away from heat and moisture.
- Instruct the client not to use this herb for longer than 8 weeks without a 3-week rest period.

Teach Client/Family

- Inform the client that pregnancy category is 1 and breastfeeding category is 2A.
- Caution the client not to give echinacea to children younger than 2 years of age.
- Caution the client to be careful not to confuse this herb with other *Echinacea* spp. that have different uses.

Elderberry ◆

(el′duhr-beh-ree)

Scientific names: *Sambucus nigra, Sambucus canadensis*

Other common names: Black elder, boretree, bountry, common elder, ellhorn, European elder, sweet elder

Origin: Elderberry is a shrub found in the United States and Europe.

Uses

Elderberry is used as a gargle for rhinitis, colds, flu in combination with sage, honey, and vinegar. It is also used as a treatment for diaphoresis, toothache, headache, sinusitis, hay fever, wounds, skin disorders, hepatic conditions, and inflammation.

Investigational Uses

Elderberry may be used orally for influenza. It is being studied as an antidiabetes agent.

Actions

Initial research on elderberry has identified antioxidant, insulin-like, and diuretic actions for this herb. However, multiple studies to confirm these actions are not yet available.

Antioxidant Action

One study provides information on the antioxidant properties of elderberry, which result from the anthocyanins present in elderberry flavonoids. These anthocyanins are responsible for scavenging in the bloodstream and the colon. Other chemical components, aglycons and glycosides, also provide antioxidant protection (Pool-Zobel et al, 1999).

Insulin-Like Action

Because elderberry has been used as a traditional treatment for diabetes mellitus, the insulin-like action of this herb has been studied. In one study, the insulin-releasing and insulin-like activity of *Sambucus nigra* produced a cumulative effect (Gray et al, 2000).

Diuretic Action

One study identified the diuretic activity of elderberry in rats. Rats treated with the herb experienced increased urine flow and sodium excretion (Beaux et al, 1999).

Other Actions

Elderberry may be useful as an antiviral. One study (Uncini et al, 2005) used elderberry to treat HIV with positive results.

Product Availability

Oil, ointment, syrup, tea, tincture, wine

Plant Parts Used: Flowers, fruit

Dosages

- Adult PO: use only cooked berries; bark and leaves are poisonous
- Adult topical: apply ointment to affected area prn
- Child PO syrup: 1-2 tsp up to tid (Romm, 2000)
- Child PO tea: ½-1 cup up to qid; serve hot (Romm, 2000)
- Child PO tincture: ½-1 tsp up to qid (Romm, 2000)

Contraindications

Class 1 herb (ripe fruit/flowers).

Until more research is available, elderberry should not be used during pregnancy and breastfeeding. Elderberry should not be used by persons with hypersensitivity to this plant or similar plants. Elderberry bark and leaves are toxic; use only the parts of the plant that are recommended.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, diarrhea
INTEG: Hypersensitivity reactions
SYST: *Cyanide toxicity (bark, leaves, unripe berries)*

Interactions

Drug

Iron salts: Elderberry tea may prevent absorption of iron salts; do not give concomitantly; space by at least 2 hours.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Flavonoids	Rutin	Antioxidant
	Quercitrin	Antiinflammatory
	Hyperoside; Isoquercitrin; Astragalin; Nicotoflorin	
Glycoside	Sambunigrine	Hepatoprotectant
Volatile oil	Palmitic acid, Alkanes, Triterpenes, Ursolic acid, Oleanic acid, Betulina, Betalic acid	
Tannin		
Mucilage		
Anthocyanin		Antioxidant
Vitamin C		
Caffeic acid		Chlorogenic
Cyanogenins Lignans		

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Client Considerations

Assess

- Assess the reason the client is using elderberry.
- Assess for hypersensitivity reactions. If present, discontinue the use of this herb and administer an antihistamine or other appropriate therapy.
- Assess for consumption of bark and leaves, which are toxic.

Administer

- Instruct the client to store elderberry products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use elderberry during pregnancy or breastfeeding until more research is available.
- Caution the client to be careful not to confuse elderberry with other *Sambucus* spp., some of which are poisonous.
- Caution the client to use only the parts of elderberry recommended for use. Other parts are toxic.
- Teach client that children should not play with the shafts of the plant; cyanide poisoning can occur.

Elecampane

(eh-li-cam-payn′)

Scientific name: *Inula helenium*

Other common names: Aunee, elfdock, elfwort, horseheal, horse-elder, scabwort, velvet dock, wild sunflower

Origin: Elecampane is native to Asia and Europe. It has been naturalized to North America.

Uses

Elecampane has been used as an antimicrobial, primarily against *Mycobacterium tuberculosis,* and as a relaxant for smooth muscles in the trachea and ileus. In traditional herbal medicine, elecampane has been used for its expectorant, antiseptic, and diuretic effects. It is also used to treat cough, whooping cough, the common cold, bronchitis, bronchiectasis, and asthma, and may be used as an anthelmintic. Elecampane is a bitter herb that is used to stimulate digestion and the appetite.

Investigational Uses

Research is underway to confirm the blood glucose and blood pressure lowering uses of elecampane.

Actions

Very little controlled research is available for elecampane.

Antimycobacterial Action

The root extracts of elecampane have been studied for their antimycobacterial effects. Chromatographic fractions of the root showed significant activity against *Mycobacterium tuberculosis,* resulting from the volatile oils alantolactone and isoalantolactone (Cantrell et al, 1999).

Muscle Relaxant Action

One study using guinea pigs demonstrated that elecampane relaxes tracheal and ileal smooth muscles. Researchers studied the effects of volatile oils isolated from 22 different plant species and compared them with the effects of catecholamines and phosphodiesterase inhibitors. One of the most potent volatile oils studied was that from elecampane root extract (Reiter et al, 1985).

Anthelmintic Action

When rabbits infected with worms were given boiled extracts of *Inula helenium,* the result was necrosis, dilatation, and atrophy of the worms (Rhee et al, 1985). These results indicate that elecampane shows promise as an anthelmintic.

Other Actions

The sesquiterpenes (alantolactone, isoalantolactone, epoxyalantolactone) show evidence of being chemoprotective (Lim et al, 2007; Dorn et al, 2006). Further studies are necessary, however.

Product Availability

Fluid extract, powder

Plant Parts Used: Rhizome (dried and fresh), roots

Dosages

Expectorant

- Adult PO infusion: pour boiling water over 1 g ground herb (1 tsp = 4 g), let stand 15 min, strain, drink 1 cup tid

Other

- Adult PO dried root: 3 g tid
- Adult PO extract: 3 g dried root/10 ml water/20 ml alcohol tid
- Adult PO fresh root: 2 tbsp tid

Contraindications

Pregnancy category is 3; breastfeeding category is 4A.
Elecampane should not be given to children younger than 12 years of age. This herb should not be used by persons with hypersensitivity to this or similar herbs.

Side Effects/Adverse Reactions

CNS: *Paralysis (large doses)*
EENT: Irritation of mucous membranes
GI: Nausea, vomiting, diarrhea, gastrointestinal spasms, anorexia (large amounts)
INTEG: Hypersensitivity reactions, severe contact dermatitis

Interactions

Drug

Antidiabetics: Elecampane may decrease blood glucose; avoid concurrent use (theoretical).
CNS depressants: Elecampane may increase the action of CNS depressants.

Herb

Sedative herbs: Elecampane may increase the action of herbs with sedative properties.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil	Alantolactone; Epoxyalantolactone Isoalantolactone; Dihydroisoalantolactone; Dihydroalantolactone	Antimycobacterial; expectorant, antifungal, diuretic, hypotensive, chemoprotective
Polyyne		
Lactone	Alantol; Alantic acid	
Polysaccharides	Inulin	

Client Considerations

Assess

- Assess for hypersensitivity reactions, including contact dermatitis. If such reactions are present, discontinue use of elecampane and administer an antihistamine or other appropriate therapy.
- Monitor for reactions indicating large dosages (nausea, vomiting, anorexia, paralysis).
- Assess for client use of antidiabetics; elecampane may increase the action of antidiabetic agents.

Administer

- Instruct the client to store elecampane products in a glass container away from moisture and heat. This herb should not be stored in plastic.
- In case of overdose, perform gastric lavage or administer activated charcoal. Overdose also may be treated with triflupromazine.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 4A.
- Caution the client not to give elecampane to children younger than 12 years of age.

Ephedra

(i-feh′drah)

Scientific names: *Ephedra sinica, Ephedra nevadensis, Ephedra trifurca, Ephedra equisetina, Ephedra distachya*

Other common names: Brigham tea, cao ma huang, desert tea, epitonin, herba ephedrae, herbal ecstasy, joint fir, ma huang, mahuuanggen, Mexican tea, Mormon tea, muzei mu huang, natural ecstacy, popotillo, sea grape, squaw tea, teamster's tea, yellow astringent, yellow horse, zhong ma huang

Origin: Ephedra is an evergreen found throughout the world.

Uses

Ephedra contains ephedrine, a central nervous system stimulant with amphetamine-like properties. It has been used in Chinese medicine to treat asthma, bronchitis, headache, pulmonary congestion, and joint pain and inflammation. More recently, it has been used for its stimulant effect and to promote weight loss.

Actions

Much research has been done on ephedrine, which is a prescription medication and a component of ephedra. Ephedrine acts primarily on beta-receptors in the heart and on alpha-receptors, causing vasoconstriction in blood vessels. It also exerts amphetamine-like effects, causing bronchodilation, decreased gastrointestinal motility, increased mydriasis, and central nervous system stimulation.

Product Availability

Capsules, extract, tablets, tea, tincture; available as a component of many combination products

Plant Parts Used: Leaves, seeds

Dosages

Dosages vary with the species of ephedra. Only *E. trifurca* and *E. nevadensis* are available as tea. Standardized products usually contain ephedrine and pseudoephedrine 6%.

- Adult PO capsules/tablets (crude herb): 500-1000 mg bid-tid (Foster, 1998)
- Adult PO extract: 12-25 mg total alkaloids, standardized to ephedrine, bid-tid (Foster, 1998)
- Adult PO tea: use 1.5-9 g herb in 1 pt boiling water, let stand 15 min, drink in divided doses up to tid
- Adult PO tincture: 15-30 drops bid-tid (Foster, 1998)

Contraindications

Pregnancy category is 4; breastfeeding category is 4A.

Ephedra should not be given to children younger than 12 years of age. It should not be used by persons with hypersensitivity to sympathomimetics, angle-closure glaucoma, seizure disorders, hyperthyroidism, diabetes mellitus, prostatic hypertrophy, arrhythmias, heart block, hypertension, psychosis, tachycardia, or angina pectoris. Ephedra has been taken off the market, but a reversal of this decision is being considered.

Side Effects/Adverse Reactions

NOTE: Side effects and adverse reactions are similar to those of ephedrine.

CNS: Anxiety, nervousness, insomnia, hallucinations, headache, dizziness, poor concentration, tremors, confusion, *seizures*, psychosis (Tormey et al, 2001)

CV: Palpitations, tachycardia, hypertension, chest pain, *arrhythmias, stroke, myocardial infarction, cardiac arrest*

GI: Nausea, vomiting, anorexia, constipation or diarrhea, *hepatotoxicity*

GU: Dysuria, urinary retention

INTEG: Hypersensitivity reactions, *exfoliative dermatitis*

Reproductive: Uterine contractions

RESP: Dyspnea

Interactions

Drug

Anesthetics, halothane: Ephedra causes increased arrhythmias when used with halothane anesthetics; do not use concurrently.
Antidiabetics: Ephedra may cause an increase in blood glucose level; monitor carefully.
Beta-blockers: Ephedra causes increased hypertension when used with beta-blockers; avoid concurrent use.
Cardiac glycosides: Ephedra may change heart rhythm; avoid using concurrently.
CNS stimulants: Ephedra will cause increased CNS stimulation when used with CNS stimulants.
Guanethidine: Ephedra may decrease the effect of guanethidine; monitor concurrent use carefully.
MAOIs, tricyclics: Hypertensive crisis occurs when ephedra is used with MAOIs, tricyclics; do not use concurrently.
Oxytocics: Ephedra causes severe hypertension when used with oxytocics; do not use concurrently.
Phenothiazines: Tachycardia may result if ephedra is used with phenothiazines; do not use concurrently.
Sympathomimetics, other: Ephedra increases the effect of sympathomimetics and also causes hypertension; do not use concurrently.
Urinary alkalizers: Ephedra increases the effect of urinary alkalizers; monitor concurrent use carefully.
Xanthines *(caffeine, theophylline):* Ephedra causes increased central nervous system stimulation; avoid concurrent use with xanthines.

Herb

Bitter orange, coffee, ginseng, green tea, guarana, Indian sida, kola nut, malvaceae, Siberian ginseng, soapwort, yerba maté: Concurrent use with ephedra may increase hypertension and central nervous system stimulation.

Food

Caffeinated coffee, cola, "Red Bull," tea: The stimulating effect of ephedra may increase with the use of these drinks.

Lab Test

AST, ALT, total bilirubin, urine bilirubin: Ephedra may increase these tests.

Pharmacology

Pharmacokinetics

Pharmacokinetics and pharmacodynamics for ephedrine are as follows: onset 15 to 60 minutes, duration 2 to 4 hours; metabolized in the liver, excreted unchanged in the urine and breast milk; crosses the blood-brain barrier and the placenta.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid	Ephedrine	Central nervous system stimulant; bronchodilator; increased myocardial contractility
	Methylephedrine; Norephedrine; Ephedrine; Ephedroxane; Pseudoephedroxane	
Tannin		
Volatile oil		
Flavonoid		
Inulin		
Catechin		
Gallic acid		

Client Considerations

Assess

- Assess the reason the client is using ephedra.
- Assess for hypersensitivity reactions and exfoliative dermatitis. If these are present, discontinue the use of ephedra and administer an antihistamine or other appropriate therapy.
- Assess for increased cardiovascular side effects (hypertension, palpitations, arrhythmias, chest pain). If these are present, discontinue the use of ephedra immediately.
- Assess for symptoms of increased central nervous system stimulation (poor concentration, insomnia, anxiety, nervousness, seizures, tremors, hallucinations). If these are present, discontinue the use of ephedra.
- Assess all medications and supplements the client is taking; many serious interactions can occur (see Interactions).

Administer

- Instruct the client not to take PO dosages exceeding 24 mg/day and not to take ephedra for longer than 1 week.
- Instruct the client to store ephedra products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 4 and breastfeeding category is 4A.
- Caution the client not to give ephedra to children younger than 12 years of age.
- Caution any client with hypersensitivity to sympathomimetics, angle-closure glaucoma, seizure disorders, hyperthyroidism, diabetes mellitus, prostatic hypertrophy, arrhythmias, heart block, hypertension, psychosis, tachycardia, or angina pectoris not to use this herb.

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- Caution the client that ephedra has been responsible for many deaths from seizure, stroke, myocardial infarction, and cardiac arrest.
- Advise the client to review all other medications and supplements taken for interactions; some interactions can be life threatening.

Eucalyptus

(yew-kuh-lip'tuhs)

Scientific name: *Eucalyptus globulus*

Other common names: Blue gum, fever tree, gum, red gum, stringy bark tree, Tasmanian blue gum

Origin: Eucalyptus is now cultivated throughout the world. It is native to Australia.

Uses

Eucalyptus is used to treat nasal/pulmonary congestion and appears frequently as a component in combination products used for sinusitis and pharyngitis. It is also used as an antispasmodic to treat irritable bowel syndrome; as a treatment for gallstones, kidney stones, and cystitis; as a central nervous system stimulant; and as an aromatherapeutic agent. Eucalyptus can be used topically as an antiseptic for wounds.

Investigational Uses

Studies are underway to determine the efficacy of eucalyptus in the treatment of infections caused by bacteria or fungi, inflammation, and diabetes mellitus.

Actions

Antimicrobial Action

Cineole, a chemical component of eucalyptus, has been shown to exert significant antimicrobial effects. One study has shown that this substance is highly effective against both gram-positive and gram-negative bacteria, as well as some fungi (Saeed et al, 1995). Another study with similar findings investigated 21 different species of eucalyptus (Hajji et al, 1993). Of these, *Eucalyptus citriodora* was the most effective species, with the widest array of antimicrobial effects. Gundidza et al (1993) determined that the essential oil of *E. globulus maidenii* was active against the fungi *Candida albicans, Penicillium citrinum,* and *Aspergillus flavus,* as well as the bacteria *Klebsiella pneumoniae, Citrobacter freundii, Serratia marcescens, Clostridium sporogenes,* and *Bacillus subtilis* (Moleyar et al, 1992). Another study demonstrated that cineole acts against *Staphylococcus aureus, Pseudomonas aeruginosa, Enterococcus faecalis,* and *Bacillus subtilis* (Carson et al, 1995).

Decongestant Action

Because of its ability to improve respiratory function significantly, one of the most common uses of eucalyptus is as an inhalant. It eases breathing by opening the nasal passages and sinuses (Cohen et al, 1982). Vicks Vaporub, a combination of eucalyptus, camphor, and menthol, significantly reduces restlessness in children with upper respiratory infections. It is postulated that the ingredients in Vicks Vaporub decrease the surface tension between water and air in the pulmonary system, increasing the surfactant of the lung.

Other Actions

Other studies have shown that cineole increases locomotor activity in laboratory animals, acts as a spasmogenic in the duodenum of rats, and decreases drowsiness.

Product Availability

Aqueous-alcoholic preparation, essential oil, fluid extract, lotion, semisolid preparation; eucalyptus is a component of various cosmetics and over-the-counter products used to treat sinusitis and pharyngitis.

Plant Parts Used: Branch tips, leaves

Dosages

NOTE: Dilute internal dosages before use.

- Adult PO eucalyptol: 0.05-0.2 ml
- Adult PO eucalyptus oil: 0.05-2 ml or 0.3-0.6 g daily
- Adult PO fluid extract: 3 g
- Adult topical aqueous-alcoholic preparation: 5%-10% prn (Blumenthal, 1998)
- Adult topical essential oil: several drops rubbed into skin prn (Blumenthal, 1998)
- Adult topical oil or semisolid preparations: 5%-20% prn (Blumenthal, 1998)

Contraindications

Class 2d herb (leaf).

Until more research is available, eucalyptus should not be used during pregnancy and breastfeeding. It should not be given to children younger than 2 years of age. Eucalyptus should not be used near mucous membranes or on the face. Persons with hypersensitivity to eucalyptus and those with kidney, gastrointestinal, or severe hepatic disease should not use this herb. As little as 3.5 ml of eucalyptus oil taken internally can be fatal.

Side Effects/Adverse Reactions

CNS: Confusion, delirium, dizziness, *seizures*
GI: Burning stomach, nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions
RESP: *Bronchospasm*

Interactions

Drug

Amphetamines, barbiturates: Eucalyptus may decrease the effectiveness of amphetamines, barbiturates; avoid concurrent use.
Antidiabetics, insulin: Eucalyptus may alter the effectiveness of antidiabetics, insulin; do not use concurrently.

Herb

Basil, glucomannan, Queen Anne's lace: These herbs may decrease blood glucose when used with eucalyptus (PO).

Lab Test

Blood glucose: Eucalyptus (PO) may decrease blood glucose levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil	Eucalyptol	Decongestant
	Cineole	Decreased renal and biliary colic; antimicrobial
	Alpha-pinene; Aromadendrene; Globulol; Trans-pinocarveol; Limonene; Eucalyptus	
Flavonoid	Quercetin	Antiinflammatory
	Rutin	Antioxidant
	Hyperoside	
Tannin		Wound healing
Fatty acids		
Fatty alcohol		
Aromatic compounds		

Client Considerations

Assess

- Assess the reason the client is using eucalyptus.
- Assess for hypersensitivity reactions. If present, discontinue use of eucalyptus and administer an antihistamine or other appropriate therapy.
- Assess for central nervous system reactions if the client is taking this herb internally.
- Assess for the use of amphetamines, barbiturates, insulin, and antidiabetics (see Interactions).

Administer

- Instruct the client to store eucalyptus products in a cool, dry place, away from heat and moisture.
- Instruct the client to dilute all products used internally before use.

Teach Client/Family

- Caution the client not to use eucalyptus in children who are younger than 2 years of age or those who are pregnant or breastfeeding until more research is available.
- Inform the client that eucalyptus may be used topically on children in combination with menthol and camphor.
- Alert the client that poisoning of children has occurred with only a few drops of eucalyptus.
- Caution clients with hypersensitivity to eucalyptus and those with renal, gastrointestinal, or severe hepatic disease not to use this herb.
- Use extreme caution if taking internally.

Evening Primrose Oil

(eev'ning prim'roes)

Scientific names: *Oenothera biennis, Primula elatior*

Other common names: Buckles, butter rose, cowslip, English cowslip, fairy caps, key flower, key of heaven, king's-cure-all, mayflower, our lady's key, palsywort, peagles, petty mulleins, plumrocks password

Origin: Evening primrose is found in North America.

Uses

Evening primrose oil is used to treat cardiovascular disease, PMS, mastalgia, rheumatoid arthritis, multiple sclerosis, eczema, breast disorders, cough, bronchitis, irritable bowel syndrome, and other digestive disorders.

Actions

Evening primrose oil has been used successfully to treat cardiovascular disease, breast disorders, premenstrual syndrome, mastalgia, rheumatoid arthritis, multiple sclerosis, atopic dermatitis, and other skin disorders. GLA has shown effectiveness in reversing neurologic damage caused by multiple sclerosis. It has been shown to decrease cardiovascular disease and obesity. Because the body does not manufacture the essential fatty acids in evening primrose oil, they must be obtained from the diet. A lack of GLA prevents the nerve cell membrane from functioning properly. GLA is needed for conduction of electrical impulses. New information suggests that evening primrose oil is ineffective for menopausal symptoms (Low, Dog, 2005).

Product Availability

Capsules

Plant Part Used: Seeds

Dosages

Eczema

- Adult PO capsules: 6 capsules/day (240 GLA)

Mastalgia

- Adult PO capsules: 6 capsules/day (240 GLA)

Diabetic Neuropathy

- Adult PO capsules: 8-12 capsules/day (320-480 mg GLA)

Premenstrual syndrome

- Adult PO capsules: 6 capsules/day (240 GLA)

Eczema

- Child PO capsules, ages 1-12: 160 mg-4 g daily (standardized to GLA 8%)

Contraindications

Pregnancy category is 2; breastfeeding category is 2A.

Evening primrose oil should not be used by persons with hypersensitivity to it or those with seizure disorders.

Side Effects/Adverse Reactions

CNS: Headache, *temporal lobe seizures in schizophrenia*

GI: Nausea, vomiting, anorexia, diarrhea, flatulence

Side Effects/Adverse Reactions—cont'd

INTEG: Hypersensitivity reactions, rash
MISC: Inflammation, *immunosuppression (with long-term use)*

Interactions

Drug

Anticoagulants, antiplatelets: Evening primrose oil can increase the action of anticoagulants and antiplatelets (theoretical) (Jellin et al, 2008).
Phenothiazines: Phenothiazines (chlorpromazine) may cause seizures if used with evening primrose oil; do not use concurrently.

Herb

Anticoagulant/antiplatelet herbs: Evening primrose oil can increase the action of herbs with anticoagulant and antiplatelet properties (Jellin et al, 2008).

Lab Test

Lipid profile: Evening primrose oil may decrease triglycerides and increase high-density lipoproteins.
Bleeding time: Evening primrose oil may increase bleeding time (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Amino Acid	Tryptophan	
Fatty Acid	Linoleic acid	Decrease cholesterol
	Gamma linoleic acid (GLA)	Decrease hepatic injury; prostaglandin production
	Oleic acid; Stearic acid; Palmitic acid	
Flavonoid	Rutin; Gossypetin	
Triterpenoid Saponin	Protoprimuloside B	

Client Considerations

Assess

- Assess the reason the client is using evening primrose oil.
- Assess for hypersensitivity reactions. If present, discontinue the use of evening primrose oil and administer antihistamines or other appropriate therapy.
- Assess for phenothiazine use. Evening primrose oil should not be used with this medication.
- Assess for clients with seizure disorders. Do not use evening primrose oil in clients with a seizure disorder.

Administer

- Instruct the client to store evening primrose oil in a sealed container away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 2 and breastfeeding category is 2A.

Eyebright

(eye′brite)

Scientific name: *Euphrasia officinalis*

Other common names: Meadow eyebright, red eyebright

Origin: Eyebright is an annual that was originally found in Europe.

Uses

Eyebright is used both internally and externally to relieve eye fatigue, redness, and to treat sty and eye infections such as conjunctivitis and blepharitis. It is also used to treat nasal catarrh in sinusitis, as well as hay fever.

Investigational Uses

It may be used for *Candida albicans* (Trovato et al, 2000) and to reduce blood glucose levels (Porchezhian et al, 2000).

Actions

Very little research is available on eyebright. It has been used since the fourteenth century to treat eye conditions, although none of the available studies have confirmed any of its actions. One study has identified cytotoxic effects, however (Trovato et al, 1996). For that reason, eyebright is not recommended for any use. Aucubin, one of the chemical components of eyebright, has shown antibacterial, hepatoprotective, and antitumor activity. Two more studies (Trovato et al, 2000) have shown antimycotic activity in vitro on *Candida albicans* isolated from clinical samples from acute vaginitis. Another study (Porchezhian et al, 2000) showed decreased blood glucose levels when *Euphrasia officinale* was given to alloxan-diabetic rats. The diabetic rats' blood glucose levels were decreased, but normal rats showed a lack of hypoglycemic effects.

Product Availability

Internal: Fresh herb, infusion, tablets, tincture; topical: infusion, fluid extract, fresh herb, lotion, poultice

Plant Part Used: Flowering plant

Dosages

Ophthalmic

- Adult topical decoction: 5-10 drops (2%) in eye to cleanse, tid-qid
- Adult topical infusion: soak a towelette in infusion and apply over eye area prn

Other

- Adult PO dried herb: 2-4 g tid as an infusion (Mills, Bone, 2000)
- Adult PO fluid extract: 2-4 ml (1:2 dilution) tid (Mills, Bone, 2000)
- Adult PO tea: cover 2-3 g finely cut herb with boiling water and let stand 10-15 min, strain, drink
- Adult PO tincture: 2-6 ml (1:5 dilution) tid (Mills, Bone, 2000)

Contraindications

Pregnancy category is 3; breastfeeding category is 2A.

Eyebright should not be used by persons with hypersensitivity to this herb.

Side Effects/Adverse Reactions

CNS: Confusion, headache, weakness, fatigue
EENT: Nasal congestion, blurred vision, photophobia, lid swelling, sneezing
INTEG: Hypersensitivity reactions

Interactions

Drug

Antidiabetics: May increase the effects of antidiabetics (theoretical) when *Euphrasia officinalis* is taken internally.
Iron salts: Eyebright tea may interfere with the absorption of iron salts; separate by at least 2 hours.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Tannin	Aucubin	Antibacterial; hepatoprotective; antitumor
		Wound healing, astringent
	Euphroside; Veronicoside; Catapol; Ixoroside; Verproside; Mussaenoside; Ladroside	
Alkaloid		
Sterol		
Acids	Caffeic	
	Feralic	
	Amino acid	
Flavonoid		
Amino acid		
Choline, Vitamins A/C		

Client Considerations

Assess

- Assess the reason the client is using eyebright.
- Assess for hypersensitivity reactions. If present, discontinue use of eyebright and administer an antihistamine or other appropriate therapy.
- Assess the eye for swelling, lacrimation, redness, and exudate.

Administer

- Instruct the client to apply eyebright externally as a compress or drops.
- Instruct the client to store eyebright products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy is category 3 and breastfeeding is category 2A.
- If an eye infection is present, instruct the client to wash hands frequently and not to share towels with others.
- Instruct the client on the correct method for washing the eye with solution.

False Unicorn Root

(fawls yew'nuh-kawrn rewt)

Scientific name: *Chamaelirium luteum*

Other common names: Blazing star, devil's bit, drooping starwort, fairy-wand, fairywart, helonias dioica, helonias root, rattlesnake, starwort

Origin: False unicorn root is a lily found in the eastern region of the United States. *Chamaelirium luteum* is a threatened species.

Uses

False unicorn root has been used as a treatment for morning sickness and menstrual irregularities such as amenorrhea and dysmenorrhea, as a uterine and liver tonic, and as a diuretic, an emetic, and a genitourinary stimulant. It is used for ovarian cysts and infertility.

Actions

Very little research is available on false unicorn root. A few very old articles, ranging from the early 1900s to the mid-1940s, compose most of the available information. The cited studies examined the gonadotropic effects of this herb on rats and its action on the uterus of the guinea pig and dog. These studies were unable to confirm any of the proposed actions of false unicorn root. One study (Brandt, 1996) proposes that the herb stimulates human chorionic gonadotropin.

Product Availability

Chopped root, dried root, tincture

Plant Part Used: Roots

Dosages

- Adult PO decoction: 1-2 tsp herb in 1 cup water, simmer 10-15 min, strain, drink tid
- Adult PO tincture: 2-4 ml (1:5) tid
- Adult PO liquid extract: 1-2 ml (1:10) tid (Jellin et al, 2008)
- Adult PO dried root: 1-2 g tid (Jellin et al, 2008)

Contraindications

Pregnancy category is 3; breastfeeding category is 2A.

False unicorn should not be given to children. Persons with hypersensitivity to false unicorn root should not use it.

Side Effects/Adverse Reactions

GI: Nausea, vomiting (large doses)

INTEG: Hypersensitivity reactions

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Steroid saponin	Chamaelirin; Helonin; Diosgenin	hCG release
Fatty acid	Oleic acid; Stearic acid; Linoleic acid	

Client Considerations

Assess

- Assess the reason the client is using false unicorn root.
- Assess for hypersensitivity reactions. If present, discontinue use of this herb and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store products containing false unicorn root in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 2A.
- Caution the client that false unicorn root should not be given to children.
- Inform the client that very little research is available to confirm any of the uses of false unicorn root.

Fennel

(feh′nuhl)

Scientific name: *Foeniculum vulgare*

Other common names: Aneth fenouil, bitter fennel, carosella, fenchel, fenouil, fenouille, finocchio, Florence fennel, funcho, garden fennel, hinojo, large fennel, sweet fennel, wild fennel

Origin: Fennel is found in Asia and Europe and is cultivated in the United Kingdom and the United States.

Uses

Fennel is used to increase breast milk and the libido, to aid digestion, as a remedy for flatulence, and to treat indigestion and menstrual irregularities.

Investigational Uses

Investigation is underway to determine the usefulness of fennel for the treatment of infections. However, research supporting the use of this herb is limited.

Actions

Antimicrobial Action

Other organisms fennel has shown bacteriostatic action against include the following: *Aerobacter aerogenes, Bacillus subtilis, E. coli, Proteus vulgaris, Pseudomonas aeruginosa, Staphylococcus albius,* and *Staphylococcus aureus*. Among its proposed actions are an antimicrobial effect against *Listeria monocytogenes* and *Salmonella enteritidis.*

Estrogenic Action

Anethole, one of the chemical components of fennel may influence milk secretion by competing with dopamine at receptor sites, thereby reducing the inhibition by dopamine of prolactin secretion.

Other Actions

Fennel has shown a bronchodilatory effect that may be due to potassium channel opening effect (Boskabady et al, 2004). Another study identified that fennel could be used to quiet a colicky infant (Savino et al, 2005).

Product Availability

Internal: dried fruit, essential oil in water (bitter or sweet), fluid extract, tablets, tincture; topical: decoction, essential oil, extract

Plant Part Used: Seeds

Dosages

- Adult PO dried fruit infusion: 900-1800 mg/day (Mills, Bone, 2000)
- Adult PO essential oil: 5-20 drops/day (Mills, Bone, 2000)
- Adult PO fennel compound tincture: 5-7.5 g daily (Blumenthal, 1998)
- Adult PO fluid extract 3-6 ml/day (1:2 dilution) (Mills, Bone, 2000)
- Adult PO herb: 5-7 g herb daily (Blumenthal, 1998)
- Adult PO tincture: 7-14 ml/day (1:5 dilution) (Mills, Bone, 2000)

Contraindications

Pregnancy category is 4; breastfeeding category is 2A.

The essential oil of fennel should not be given to infants or small children. Fennel should not be used by those with hypersensitivity to it, and it should not be used for extended periods.

Side Effects/Adverse Reactions

CNS: *Seizures*, hallucinations
GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions, contact dermatitis, photosensitivity
SYST: *Pulmonary edema, possible hormone-sensitive cancers*

Interactions

Drug

Anticonvulsants: Fennel may increase the risk of seizures; avoid concurrent use.
Ciprofloxacin: Fennel affects the absorption, distribution, and elimination of ciprofloxacin. If the two are used concurrently, their dosages should be separated by at least 2 hours.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Components	Possible Action
Volatile oil	Anethole	Phytoestrogen, TNF inhibitor, secretory effect
	Dianethole; Photoanethole; Fenchone	
	Estragole; Limonene; Camphene; Alpha-pinene	Procarcinogen
Fixed oil	Oleic acid; Linoleic acid; Petroselinic acid	
Tocopherol		
Flavonoid	Kaempferol	Antiinflammatory

Continued

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Components	Possible Action
Vitamin **Mineral** **Umbelliferone** **Terpinene** **Terpinolene**		

Client Considerations

Assess

- Assess the reason the client is using fennel.
- Assess for hypersensitivity reactions, contact dermatitis. If these are present, discontinue use of this herb and administer an antihistamine or other appropriate therapy.
- Assess for the use of anticonvulsants, ciprofloxacin (see Interactions).

Administer

- Instruct the client to store fennel in a sealed container away from moisture and heat.

Teach Client/Family

- Inform the client that pregnancy category is 4 and breastfeeding category is 2A.
- Caution the client not to give the essential oil to infants or small children.
- Warn the client of the life-threatening side effects of fennel.

Fenugreek

(fen'yuh-greek)

Scientific name: *Trigonella foenum-graecum*

Other common names: Bird's foot, Greek hayseed, trigonella

Origin: Fenugreek is an annual found in Europe and Asia.

Uses

Fenugreek is taken internally to treat gastrointestinal complaints, including constipation, dyspepsia, and gastritis. Fenugreek is used to promote lactation, and for menstrual and menopausal discomfort. It is used topically to promote wound healing and to treat ulcers of the leg and cellulitis.

Investigational Uses

Studies are underway to determine the usefulness of fenugreek as an antioxidant and as a treatment for diabetes mellitus, gastric ulcers, hypercholesteremia, and infections such as tuberculosis.

Actions

Anticholesteremic Action

Fenugreek has been studied in diabetic rats to evaluate lipid peroxidation and antioxidant effects. Results revealed disruption of free radical metabolism in the diabetic animals (Ravikumar et al, 1999). Alpha-tocopherol levels increased significantly.

Lower body weight and blood lipid levels were demonstrated in the laboratory when fenugreek was given for 6 weeks (Xue et al, 2007).

Analgesic Action

One study using laboratory rats evaluated tail-flick as a response to pain. When a large amount of fenugreek extract was given to the rats, tail-flicking behavior decreased, indicating a reduction in pain (Javen et al, 1997). Fenugreek has a central analgesic action and spinal 5-HT system is involved in this action (Parvizpur et al, 2004).

Antidiabetic Action

One study evaluated diabetic rats after they were fed fenugreek seed and its extracts (Ali et al, 1995). No effects were evident on fasting blood glucose levels with fenugreek alone, but when the rats received fenugreek simultaneously with glucose, a significant reduction in blood glucose occurred. Many other studies have confirmed the antidiabetes effects of fenugreek (Abdel-Barry et al, 1997, 2000; Gupta et al, 1999, 2001; Vats et al, 2002).

Other Actions

The effect of fenugreek seeds compared to omeprazole was evaluated on ethanol-induced gastric ulcers. The result was significant ulcer protective effects (Suja et al, 2002).

Product Availability

Capsules, crude herb, defatted fenugreek powder, fluid extract, powder (made from dried seeds)

Plant Part Used: Seeds

Dosages

Diabetes Mellitus

- Adult PO defatted fenugreek powder: 50 g/day (Murray, Pizzorno, 1998)

Other

- Adult PO: 1-6 g seeds tid
- Adult PO: 6 g herb (Blumenthal, 1998)
- Adult PO powdered seeds: 50 mg bid
- Adult topical: 50 g powdered herb dissolved in 250 ml water, daily (Blumenthal, 1998)

Contraindications

Pregnancy category is 4; breastfeeding category is 2A.

Until more research is available, fenugreek should not be used in children. Persons with hypersensitivity to fenugreek should not use it.

Side Effects/Adverse Reactions

INTEG: Hypersensitivity reactions

SYST: Bruising, petechiae, *bleeding*

Interactions

Drug

All medications: Because of the rapid rate at which this herb moves through the bowel and coats the gastrointestinal tract, fenugreek may reduce absorption of all medications used concurrently.

Continued

Interactions—cont'd

Anticoagulants *(anisindione, dicumerol, heparin, warfarin),* ***antiplatelets, NSAIDs:*** There is a possible increased risk of bleeding when fenugreek is used concurrently with anticoagulants, antiplatelets, NSAIDs.

Antidiabetics: Because fenugreek lowers blood glucose levels, increased hypoglycemia is possible when this herb is used concurrently with antidiabetics (theoretical).

Corticosteroids, estrogens: Fenugreek may inhibit the action of these agents (theoretical) (Jellin et al, 2008).

MAOIs: Fenugreek can increase the action of MAOIs (theoretical) (Jellin et al, 2008).

Food

Fabaceae *(soybean, chickpea, peanuts, green peas):* Fenugreek allergy may develop if allergic to Fabaceae species (theoretical) (Jellin et al, 2008).

Lab Test

Blood glucose, LDL, total cholesterol: Fenugreek may decrease total cholesterol, blood glucose (decoctions, infusions), and LDL cholesterol.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Components	Possible Action
Steroid saponin	Fenugreekine; Smilagenin; Diosgenin; Trigogenin; Gitogenin; Yamogenin; Neotigogenin; Neogitogenin	Decreased blood glucose
Alkaloid	Gentianine; Carpaine; Choline; Trigonelline	Anticholesterol
Amino acid	Lysine; Hydroxyisoleucine; Tryptophan; Histidine; Arginine	
Mucilages		Antidiarrheal, laxative
Coumarin		Anticoagulant
Vitamin		
Mineral		
Fiber		

Client Considerations

Assess

- Assess the reason the client is using fenugreek.
- Assess for hypersensitivity reactions. If present, discontinue use of this herb and administer an antihistamine or other appropriate therapy.
- Assess for increased hypoglycemia in diabetic clients who are taking antidiabetics (see Interactions).
- Assess for bleeding in clients who are using anticoagulants (see Interactions).

Administer

- Instruct the client to store fenugreek products in a sealed container away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 4 and breastfeeding is category 2A.
- Caution the client not to use this herb in children until more research is available.
- Instruct the client to report side effects and adverse reactions (bleeding, hypersensitivity, hypoglycemia) to the health care provider.
- Advise the client that urine may smell like maple syrup.

Feverfew

(fee'vuhr-fyew)

Scientific name: *Chrysanthemum parthenium*

Other common names: Altamisa, bachelors' button, chamomile grande, featherfew, featherfoil, febrifuge plant, midsummer daisy, mutterkraut, nosebleed, Santa Maria, wild chamomile, wild quinine

Origin: Feverfew is a perennial found throughout the world.

Uses

Feverfew is used traditionally to treat menstrual irregularities, threatened spontaneous abortion, arthritis, and fever.

Investigational Uses

Research is underway to determine whether feverfew is effective in the prevention and treatment of migraine headache.

Actions

Antimigraine Action

Primary research has focused on the use of feverfew for the prevention and treatment of migraine headache. In a study of 57 patients with severe migraine headaches, use of feverfew significantly reduced pain intensity, vomiting, and noise sensitivity (Palevitch et al, 1997). Feverfew acts as a significant migraine preventive when taken for 4 months. One theory is that feverfew decreases platelet aggregation and inhibits production of prostaglandins and thromboxanes. One of the chemical components of this herb also prevents the release of serotonin from platelets. The release of serotonin from platelets is thought to stimulate migraine headache.

Antiinflammatory Action

Feverfew may decrease the release of polymorphonuclear leukocytes in joints that are arthritic and inflamed (Heptinstall et al, 1998). Another study demonstrated that feverfew inhibits arachidonate metabolism in leukocytes that may increase inflammation (Williams et al, 1995).

Product Availability

Capsules, crude herb (fresh), extract, tablets, tincture

Plant Part Used: Leaves

Dosages

Migraine Prophylaxis and Treatment

- Adult PO freeze dried extract: 25 mg daily
- Adult PO fresh leaves: 2 large or 4 small leaves/day chewed or mixed with food (McCaleb et al, 2000)
- Adult PO standardized extract: 275 mg/day (McCaleb et al, 2000) or 0.25-0.5 mg parthenolide (Murray, Pizzorno, 1998); other sources report 50-100 mg of whole leaf extract
- Adult PO capsules/tablets: 300-400 mg tid-qid (Foster, 1998)
- Adult PO tincture: 15-30 drops per day (Foster, 1998) standardized to 0.2-0.7 mg parthenolide

Contraindications

Class 2b herb.
Pregnancy category is 4; breastfeeding category is 1A.
Feverfew should not be given to children. It should not be used by persons with hypersensitivity to it or asteraceae/compositae family.

Side Effects/Adverse Reactions

CNS: Dizziness
EENT: Mouth ulcers (chewed leaves)
GI: Nausea, vomiting, anorexia, abdominal pain
INTEG: Hypersensitivity reactions, contact dermatitis
MS: Muscle stiffness, muscle and joint pain

Interactions

Drug

Anticoagulants *(anisindione, dicumarol, heparin, warfarin),* ***antiplatelets, NSAIDs:*** Feverfew may increase the anticoagulant properties of anticoagulants, antiplatelets, NSAIDs (theoretical).
Iron supplements: Feverfew may decrease the absorption of iron, separate by ≥2 hours.

Herb

Anticoagulant, antiplatelet herbs: Feverfew may increase anticoagulation and decrease platelet aggregation (Jellin et al, 2008).

Lab Test

Platelet aggregation: Feverfew may decrease platelet aggregation.
Prothrombin time, plasma partial prothrombin time: It may increase prothrombin time and plasma partial prothrombin time in clients taking warfarin concurrently.

Primary Chemical Components and Possible Actions

Individual Class	Individual Component	Possible Action
Volatile oils	Angelate, Costic acid, Pinene	
Monoquiterpene		Sedative

Primary Chemical Components and Possible Actions—cont'd

Individual Class	Individual Component	Possible Action
Sesquiterpene		
Sesquiterpene lactone	Chrysanthemolide; Parthenolide	Decreases serotonin Platelet inhibitor; prostaglandin synthesis; antibacterial
	Chrysanthemonin; Magnoliolide	
Melatonin		Sleep regulation
Flavonoid	Apigenin; Luteolin; Chrysoeriol; Scutellarein; Santin	
Santamarin		
Tanaparthin		
Reynosin		
Monoterpenes	Camphor	

Client Considerations

Assess

- Assess the reason the client is using feverfew.
- Assess for hypersensitivity reactions. If present, discontinue use of this herb and administer an antihistamine or other appropriate therapy.
- Assess for mouth ulcers and muscle and joint pain or stiffness.

Administer

- Instruct the client to store feverfew products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 4 and breastfeeding category is 1A.
- Caution the client not to give feverfew to children.

Figwort

(fig′wuhrt)

Scientific names: *Scrophularia nodosa, Scrophularia ningpoensis*

Other common names: Carpenter's square, common figwort, kernelwort, knotty rooted figwort, rose-noble, scrofula plant, square stalk, stinking christopher, throatwort

Origin: Figwort is a perennial found in China.

Uses

Figwort is most often used topically to treat skin disorders such as acne, eczema, contact dermatitis, urticaria, psoriasis, and pruritus. Figwort is used internally to decrease gastrointestinal symptoms, stimulate cardiac function, and reduce inflammation.

Actions

Very little research is available on figwort. This herb is classified as an iridoid glycoside and is related to the foxglove plant, from which digitalis is derived. Therefore some of the actions of figwort are similar to those of digitalis-like drugs. However, no primary research supports the possible cardiac actions of this herb.

Miscellaneous Actions

Figwort has been tested for its insulin-binding reaction (Liu et al, 1991), its antiprotozoacidal activity (Martin et al, 1998), its antiinflammatory activity (Fernandez et al, 1998), and its possible antitoxic effects in chemotherapy (Liu et al, 1993). The 1991 Liu study determined that figwort did not alter insulin binding in any way. Martin et al evaluated 60 plant species and found that figwort was active against *Trichomonas vaginalis* and *Leishmania infantum* (Martin et al, 1998). The Fernandez study found that figwort used topically exerts stronger antiinflammatory action than does figwort used orally. The action of this herb used topically is influenced by migration of neutrophils into the infected area. The 1993 Liu study found that figwort prevents toxicity in chemotherapy (Liu et al, 1993). When chemotherapeutic agents were combined with several Chinese herbs, the group treated with the herbs suffered fewer toxic reactions at a statistically significant level. Stevenson et al (2002) identified the wound healing activity of glycosides in *Scrophularia nodosa.*

Product Availability

Fluid extract, soak, tincture

Plant Parts Used: Dried flowers, dried leaves

Dosages

- Adult PO fluid extract: 2-8 ml (1:1) daily-bid
- Adult PO infusion: 2-8 g herb daily
- Adult PO tincture: 2-4 ml (1:5 dilution) daily-bid
- Adult topical: use as a soak or apply by compress prn

Contraindications

Class 2d herb (*S. ningpoensis* whole herb root).

Until more research is available, figwort should not be used during pregnancy and breastfeeding. It should not be given to children. Figwort should not be used by persons with hypersensitivity to this herb or those who have serious cardiac disease.

Side Effects/Adverse Reactions

CV: Decreased heart rate, *heart block, asystole*
GI: Nausea, vomiting, anorexia, diarrhea
INTEG: Hypersensitivity reactions

Interactions

Drug

Antiarrhythmics, beta-blockers, cardiac glycosides: The action of figwort may increase the effects of antiarrhythmics, beta-blockers, cardiac glycosides; do not use concurrently.
Antidiabetics: The action of figwort may increase blood glucose levels, decrease antidiabetic action of insulin.
Diuretics: Potassium-losing diuretics with figwort may cause hypokalemia (theoretical) (Jellin et al, 2008).

Interactions—cont'd

Herb

Cardiac glycoside herbs *(black hellebore digitalis, lily of the valley, motherwort, oleander, pheasant's eye):* Cardiac glycoside effects may be increased.

Lab Test

Blood glucose: Figwort may increase blood glucose.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Amino acid	Isoleucine; Leucine; Alanine; Lysine; Tyrosine; Phenylalanine; Threonine; Valine	
Flavonoid	Aucubin; Catalpol	Laxative
	Diosmetin	
	Harpagide; Harpagoside; Isoharpagoside; Procumbid; Iridoids	Cardioactive, antiinflammatory
Phenolic acid	Ferulic acid	Antiinflammatory
	Vanillic acid; Caffeic acid; Cinnamic acid	
Glycosides	Ningposides A, B, C, Sibirioside A, Cistanoside D, Angoroside C acteoside, Decaffeoy lactoside, Cistanoside F	
	Harpagoside, Aucubin, Catalpol (Sesterhenn, et al, 2007)	
Saponin		
Asparagine		
Tannins		

Client Considerations

Assess

- Assess the reason the client is using figwort.
- Assess for hypersensitivity reactions. If present, discontinue use of figwort and administer an antihistamine or other appropriate therapy.
- Assess cardiac status, including blood pressure and pulse (character). Watch for decreasing pulse. Patients with cardiac disorders should not take figwort.
- Assess for other cardiovascular drugs the client may be using. Figwort should not be used concurrently with antiarrhythmics, cardiac glycosides, or beta-blockers (see Interactions).

Administer

- Instruct the client to store figwort products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use figwort in children or those who are pregnant or breastfeeding until more research is available.
- Warn the client of the life-threatening side effects of figwort.
- Advise the client that research is lacking and therefore any use or action of figwort is speculative.

Fish Oils

(fish oylz)

Scientific names: DHA (docosahexaenoic acid), EPA (eicosapentaenic acid)

Other common names: Omega 3 fatty acids, omega 3 oils

Uses

Fish oils are used to decrease inflammation in rheumatoid arthritis, to prevent cardiovascular disease, and to treat major depressive disorder, bipolar disorder, and dysmenorrhea. Fish oils are also used to prevent low birth weight infants in women with previous pregnancy complications.

Actions

Fish oils when taken orally alter major prostaglandin and leukotriene synthesis, which leads to decreased inflammation. There have been studies with no change in the condition being studied when fish oils were added. The conditions that did not improve were attention deficit–hyperactivity disorder, multiple sclerosis, male fertility, and asthma. Fish oils appear to be effective in rheumatoid arthritis, cardiovascular disease prevention (Cleland et al, 2006), bipolar disorder, depression, dysmenorrhea (Jellin et al, 2008), and lowering triglycerides (Aligeti et al, 2007). The March of Dimes funded a study showing fish oils were able to prevent low birth weight infants (Olsen et al, 2007).

Product Availability

Capsules, liquid

Dosages

- Adult PO capsules/liquid: 3-9 g/day

Contraindications

Fish oils should not be used in children or those who are pregnant, breastfeeding, hypersensitive, or have breast/prostate cancer or heart disease.

Interactions

Drug

Anticoagulants: Fish oils may increase the risk of bleeding; avoid concurrent use.

Client Considerations

Assess

- Assess the reason the client is using fish oils.
- Identify if the client is taking anticoagulants that should not be taken with this product.
- Assess if the client has breast/prostate cancer or coronary disease.

Administer

- Keep fish oils in a dry area, away from direct sunlight.

Teach Client/Family

- Teach the patient that fish oils should not be used in children or those who are pregnant or breastfeeding until more research is available.

Flax

(flaks)

Scientific name: *Linum usitatissimum*

Other common names: Flaxseed, linseed, lint bells, linen flax, linum

Origin: Flax is a flowering annual found in the United States, Canada, and Europe.

Uses

Flax is generally used internally as a laxative and an anticholesteremic. Topically it is used as an inflammatory.

Investigational Uses

Researchers are experimenting with the use of flax to treat inflammatory conditions such as colitis, irritable bowel syndrome, diverticulitis, osteoarthritis, psoriasis, and eczema. It may also be effective in the treatment of allergies and autoimmune disorders such as multiple sclerosis, cancer, lupus erythematosus, and rheumatoid arthritis, as well as learning disorders such as attention deficit disorder with or without hyperactivity and dyslexia. Flax is also used experimentally to treat hypertension and agoraphobia.

Actions

Adequate levels of zinc and acidophilus are needed to metabolize flax.

Anticancer Action

One study showed a significantly reduced incidence of breast cancer when women consumed high levels of phytoestrogens such as the lignans found in flax products (Ingram et al, 1997). This study compared 144 women with breast cancer with 144 women without breast cancer. The women were matched demographically. Investigators determined that the largest reduction in breast cancer was associated with a high intake of equol, one of the flavone components, and enterolactone, a substance formed by the breakdown of flax.

Anticholesteremic Action

In a 6-week double-blind crossover study, 38 postmenopausal women with elevated cholesterol were given whole flaxseed and sunflower seed. In the experimental group, cholesterol dropped by nearly 15% (Arjmandi et al, 1999). Other studies have confirmed that the addition of flax to the diet reduces risk factors for coronary artery disease, thrombotic disorders, and cerebrovascular accident.

Other Actions

Flax is composed of lignans and isoflavones that possess estrogenic action (Abarzua et al, 2007). There is also a prophylactic action of flax against cyclophosphamide-induced stress (Bhatia et al, 2006).

Product Availability

Capsules, oil, powder, softgel capsules

Plant Part Used: Seeds

Dosages

Flax may be standardized to 58% alpha-linolenic acid.

Agoraphobia

- Adult PO: 2-6 tbsp/day (Rudin, 1981)

Diabetes Mellitus

- Adult PO: 1 tbsp/day (Murray, Pizzorno, 1998)

Eczema

- Adult PO: 1 tbsp/day (Murray, Pizzorno, 1998)

General Use

- Adult PO oil: 1-2 tbsp daily in divided doses.
- Adult PO seeds: 2½ tsp ground seeds bid-tid (McCaleb et al, 2000); whole flaxseed can be ground at home using a small food processor to break the hard portion of the outside of the seed; ground flax should be mixed in 6-8 oz water and eaten within 15 min

Hypertension

- Adult PO: 1 tbsp/day (Murray, Pizzorno, 1998)

Inflammation

- Adult topical: 30-40 g flax flour (Blumenthal, 1998), moistened to form a paste, prn

Multiple Sclerosis

- Adult PO: 1 tbsp/day (Murray, Pizzorno, 1998)

Rheumatoid Arthritis

- Adult PO: 1 tbsp/day (Murray, Pizzorno, 1998)

Contraindications

Class 2d herb (seed).

Until more research is available, flax should not be used during pregnancy and breastfeeding. It should not be given to children. This herb should not be used by persons with bowel obstruction or dehydration, or by persons with hypersensitivity to it. Flax poultice should not be used on open wounds. Only mature seeds should be used; immature seeds are toxic.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, diarrhea, flatulence, *GI obstruction*
INTEG: Hypersensitivity reactions
Overdose: *Weakness, incoordination, dyspnea, tachypnea, paralysis, seizures, death*

Interactions

Drug

All oral medications: Absorption of medications may be decreased if taken concurrently with flax.

Anticoagulants, antiplatelets: Flax may increase risk of bleeding (Jellin et al, 2008).

Antidiabetics, laxatives: Flax may increase the action of laxatives and antidiabetics, resulting in diarrhea, (Jellin et al, 2008).

Lab Test

Cholesterol, triglycerides: Flax can decrease cholesterol and increase triglycerides (Jellin et al, 2008).

Glucose: Flax may decrease blood glucose (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Fatty acid	Linolenic acid Linoleic acid; Oleic acid	Decreases cholesterol
Mucilage	Galactose; Xylose; Arabinose; Rhamnose	
Protein		
Flavonoid	Equol	Antitumor
Lignan	Secoisolariciresinol diglucoside	Anticancer, estrogenic

Client Considerations

Assess

- Assess the reason the client is using flax.
- Assess for hypersensitivity reactions. If present, discontinue use of this herb and administer an antihistamine or other appropriate therapy.
- Assess for overdose reactions.
- Assess for use of medications, including laxatives (see Interactions).

Administer

- Instruct the client to refrigerate flax products to prevent fatty acid breakdown.

Teach Client/Family

- Caution the client not to use flax in children or in those who are pregnant or breastfeeding until more research is available.
- Inform the client that flax may decrease the absorption of all other medications.
- Warn the client to use only mature seeds; the immature seeds are toxic.
- Inform the client of the symptoms of overdose (see Side Effects).

Folic Acid

(foe′ lick a′ sid)

Scientific name: Vitamin B_9

Other common names: Folate, folvite

Origin: Synthetic

Uses

Folic acid is used for hepatic disease, alcoholism, hemolysis, intestinal obstruction, pregnancy, and megaloblastic or macrocytic anemia caused by folic acid deficiency.

Actions

Folic acid is needed for erythropoiesis. It increases RBC, WBC, and platelet formation in megaloblastic anemias.

Product Availability

Tablets 0.1, 0.4, 0.8, 1, 5 mg; inj 5, 10 mg/ml

Dosages

Therapeutic Dose

- Adult PO/IM/SUBCUT/IV: up to 1 mg daily
- Child PO/IM/SUBCUT/IV: up to 1 mg daily

Pregnancy/Breastfeeding

- Adult PO/IM/SUBCUT/IV: 0.8 mg/day

Maintenance Dose

- Adult PO/IM/SUBCUT/IV: 0.4 mg/day
- Child PO/IM/SUBCUT/IV >4 yr: 0.4 mg/day
- Child PO/IM/SUBCUT/IV <4 yr: up to 0.3 mg/day
- Infants PO/IM/SUBCUT/IV: up to 0.2 mg/day

Contraindications

Folic acid should not be used in those who are hypersensitive or who have anemias other than megaloblastic, macrocytic anemia, and uncorrected pernicious anemia

Side Effects/Adverse Reactions

INTEG: Flushing

RESP: *Bronchospasm*

Interactions

Drug

Methotrexate: Folic acid may decrease the action of methotrexate (Khanna et al, 2005).

Pharmacology

Pharmacokinetics

Peak ½-1 hr (PO), bound to plasma proteins, excreted in breast milk, metabolized by the liver, excreted in small amounts via kidneys.

Client Considerations

Assess

- Assess the reason the client is using folic acid.
- Monitor weight while taking this product.
- Folate levels: 6-15 mcg/ml, Hgb, Hct, and reticulocyte count.

Administer

- IV: direct and undiluted 5 mg or less given at 1 min or more. It may be added to most IVs.

Teach Client/Family

- Teach client to obtain necessary lab work.

Fo-ti

(foe'tee)

Scientific name: *Polygonum multiflorum*

Other common names: Chinese cornbind, Chinese knotweed, flowery knotweed, ho shou wu

Origin: Fo-ti is a climbing perennial found in China.

Uses

In traditional Chinese medicine, fo-ti is used as a general tonic. It is also used to slow the aging process and to treat insomnia, autoimmune disorders, hyperlipidemia, and diabetes mellitus. It may also be used to treat diverticular disease and hemorrhoids. A laxative action is present in the chemical components of fo-ti.

Investigational Uses

Research is underway to confirm the myocardial protective use of *Polygonum multiflorum,* as well as the cognitive enhancing use.

Actions

Information on fo-ti is lacking. Most of the available information comes from Chinese literature published in the early to mid-1990s. A few studies are available documenting the cholesterol-lowering action of this herb in animals (Chevallier, 1996; Gao et al, 2007a; Hong et al, 1994; Yang, 2005), and the root has been shown to lower triglyceride accumulations in animal livers (Liu et al, 1992). Another study (Yim et al, 2002) showed a myocardial protective action against ischemia-reperfusion injury when *Polygonum multiflorum* extract is used. Hsieh et al (2000) showed no cognitive enhancing properties of *Polygonum multiflorum* when it was studied with other Chinese herbs. An extract of fo-ti was shown to prevent skin damage from ultraviolet radiation and is thought to possess antiaging properties (Hwang et al, 2006).

Product Availability

Sliced root; available in combination in many herbal tonics

Plant Part Used: Roots

Dosages

No published dosages are available.

Contraindications

Until more research is available, fo-ti should not be used during pregnancy and breastfeeding. It should not be given to children. Fo-ti should not be used by persons with diarrhea or those with hypersensitivity to this herb.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, diarrhea, laxative dependence (long-term use)
INTEG: Hypersensitivity reactions

Interactions

Drug

Antidiabetics: Fo-ti may increase the action of antidiabetics (Jellin et al, 2008).
Diuretics: Fo-ti may increase the risk of hypokalemia when used with potassium-losing diuretics (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Anthraquinone	Emodin Rhein	Laxative
Chrysophanol **Chrysophanic acid**		

Client Considerations

Assess

- Assess the reason the client is using fo-ti.
- Assess for hypersensitivity reactions. If present, discontinue use of this herb and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to take fo-ti PO.
- Inform the client that dark roots are the most potent. Roots with white streaks are of a lesser quality.
- Instruct the client to store fo-ti in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use fo-ti in children or in those who are pregnant and breastfeeding until more research is available.
- Advise the client that long-term use of this herb may lead to laxative dependence.

Fumitory

(fyew′muh-toe-ry)

Scientific name: *Fumaria officinalis*

Other common names: Beggary, earth smoke, hedge fumitory, wax dolls

Origin: Fumitory is an annual bush or shrub found in Africa, Europe, the United States, Canada, Asia, and Australia.

Uses

Fumitory is taken internally as a laxative, a diuretic, and a treatment for biliary illness. Topically, it may be used to treat various skin disorders such as eczema, psoriasis, acne, and scabies. Fumitory may be used as an eyewash to ease conjunctivitis.

Investigational Uses

Researchers are experimenting with the usefulness of fumitory in the treatment of arrhythmias.

Actions

A review of the literature reveals very few studies supporting the use of fumitory as a diuretic, a laxative, or for treatment of skin disorders. In Germany, fumitory is approved for treatment of colicky pain in the gallbladder or biliary system. Only two studies have evaluated the possible use of fumitory in the treatment of cardiac disorders. The first study, using dogs, evaluated the efficacy of its alkaloid components in treating temporary disorders of coronary blood flow. The injected alkaloids significantly reduced ischemic shifts (Gorbunov et al, 1980). The second study evaluated a number of different plant species grown in Bulgaria. Results showed that fumitory exerted a healing effect on ischemic heart disease, atherosclerosis, and hypertension (Petkov, 1979). Another study (Rao et al, 1998) showed *Fumaria indica,* a different *Fumaria* sp. from that used for the preparations that are typically available, to be hepatoprotective. When used for irritable bowel syndrome (IBS), there was no noticeable benefit over a placebo (Brinkhaus et al, 2005).

Product Availability

Dried herb, extract, tincture

Plant Parts Used: Flowering parts, leaves

Dosages

- Adult PO dried herb: 6 g/day (Blumenthal, 1998)
- Adult PO fluid extract: 2-4 ml (1:1 dilution) in 25% alcohol, tid
- Adult PO tea: 2-4 g tid
- Adult PO tincture: 1-4 ml (1:5 dilution) in 45% alcohol, tid
- Adult topical: apply dried herb prn

Contraindications

Until more research is available, fumitory should not be used during pregnancy and breastfeeding. It should not be given to children. Fumitory should not be used by persons with seizure disorders or increased intraocular pressure, and it should not be used by those with hypersensitivity to it.

Side Effects/Adverse Reactions

CNS: *Seizures (overdose)*
CV: Decreased blood pressure, decreased pulse
EENT: Increased intraocular pressure
GI: Nausea, vomiting, anorexia
GU: *Acute renal failure*
INTEG: Hypersensitivity reactions

Continued

Interactions

Drug

Antiarrhythmics, beta-blockers, cardiac glycosides: The actions of fumitory may increase the effects of antiarrhythmics, beta-blockers, cardiac glycosides; do not use concurrently.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid	Fumarine	Negative chronotropic; Antihistaminic
	Cryptopine	Negative chronotropic
	Aurotensine; Coridaline; Sinactine; Stylopine; Cryptocavine; Sanguinarine; Bulbocapnine	
	Fumaricine; Fumritine; Fumariline	
Flavonoid	Quercetin; Isoquercetin	Antiinflammatory; bile stimulant/ antispasmodic; antioxidant
	Fumaric acid	
Mucilage		
Resin		
Caffeic acid		Bile stimulant/ antispasmodic
Cinnamic acid		Choleretic

Client Considerations

Assess

- Assess the reason the client is using fumitory.
- Assess for hypersensitivity reactions. If present, discontinue use of fumitory and administer an antihistamine or other appropriate therapy.
- Assess the client's cardiac status, including blood pressure and pulse (character). Watch for decreasing pulse.
- Assess for other cardiovascular drugs the client may be taking. Fumitory should not be taken concurrently with antiarrhythmics, cardiac glycosides, or beta-blockers (see Interactions).

Administer

- Instruct the client to store fumitory products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use fumitory in children or those who are pregnant or breastfeeding until more research is available.

Galanthamine

Scientific name: *Galanthus nivalis*

Origin: Galanthamine is a bulb plant found throughout the world.

Uses

Galanthamine is used widely in other countries to treat Alzheimer's disease, myasthenia gravis, and paralysis caused by polio.

Investigational Uses

Research is being conducted for the use of galanthamine as an antiinfective.

Actions

Acetylcholinesterase Inhibition

Research has identified galanthamine as an acetylcholinesterase inhibitor that can reverse the effects of nondepolarizing muscle relaxants (Schuh, 1976). The use of galanthamine has produced both positive and negative effects in clients with Alzheimer's disease. In several studies (Bores, 1996; Iliev, 2000; López-Pousa et al, 2007), a course of galanthamine produced an improvement in cognitive functioning in humans and animals. Other studies showed no such improvement. There is a neuroprotective action in galanthamine (Takada-Takatori et al, 2006).

Antiinfective Action

In a study of rats infected with salmonella, the rats were fed *Galanthus nivalis* agglutinin for 3 days preinfection and 6 days postinfection. *G. nivalis* significantly reduced salmonella numbers in the small bowel and large intestine of the infected rats (Naughton, 2000). In another study, in vitro, *G. nivalis* inhibited the growth of *Chlamydia trachomatis* by binding a glycoprotein present in the infecting organism (Amin, 1995). A strong immune response resulted when the glycoproteins of HIV-1, HIV-2, and SIV were purified with *G. nivalis* (Gilljam, 1993).

Product Availability

Ampules, tablets

Plant Part Used: Bulb

Dosages

- Adult PO ampules or tablets: 5 mg tid; dosage may be increased gradually to 40 mg daily

Contraindications

Until more research is available, galanthamine should not be used during pregnancy and breastfeeding. It should not be given to children. This herb should not be used by persons with exposure to organophosphate fertilizers or those with hypersensitivity to it.

Side Effects/Adverse Reactions

CNS: Dizziness, anxiety, agitation, restlessness, insomnia
GI: Nausea, vomiting, anorexia, abdominal cramping and pain, diarrhea
INTEG: Hypersensitivity reactions

Interactions

Drug

MAOIs: Do not use galanthamine concurrently with MAOIs; hypertensive crisis may occur.

Pharmacology

Pharmacokinetics

The components of galanthamine are known to cross the blood-brain barrier.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid		Acetylcholinesterase inhibitor

Client Considerations

Assess

- Assess the reason the client is using galanthamine.
- Assess for hypersensitivity reactions. If present, discontinue the use of this herb and administer an antihistamine or other appropriate therapy.
- Assess for the use of MAOIs and organophosphate fertilizers, neither of which should be used concurrently with galanthamine (see Interactions).

Administer

- Instruct the client to store galanthamine products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use galanthamine in children or in those who are pregnant or breastfeeding until more research is available.
- Inform the client that conventional treatments may be more effective than galanthamine.

Gamma Linolenic Acid

(gam′ uh linn-oh-leen′-ick as′id)

Other common name: GLA

Origin: See evening primrose oil, borage.

Uses

Gamma linolenic acid is being used for rheumatoid arthritis, cancer prevention, ADHD, depression, and psoriasis and may be used with tamoxifen in breast cancer. It may also be used for diabetic neuropathy and hyperlipidemia.

Actions

Omega-6 fatty acid has antiinflammatory and antiproliferative effects. It may act on T cells to normalize the immune response in rheumatoid arthritis and cancer (Jellin et al, 2008). Research has been mixed. Because GLA is completely safe, it may be used, even if there is some doubt about the therapeutic value (Dobryniewski et al, 2007).

Product Availability

Capsules

Plant Parts Used: Seeds of evening primrose oil, borage

Dosages

Rheumatoid Arthritis

- Adult PO capsules: 1.1 g/day

Diabetic Neuropathy

- Adult PO capsules: 360-480 mg/day

Hyperlipidemia

- Adult PO capsules: 1.5-6 g/day

Contraindications

GLA should not be used in pregnancy or breastfeeding. It should not be given to children.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, diarrhea, flatulence

HEMA: Increased bleeding time

Interactions

Drug

Anticoagulants, antiplatelets: When anticoagulants, antiplatelets are given with GLA, they may increase the risk for bleeding.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Fatty acid	Linoleic acid	Decrease cholesterol
	Gamma linoleic acid (GLA)	Decrease hepatic injury
	Oleic acid; Stearic acid; Palmitic acid	
Flavonoid	Rutin; Gossypetin	
Triterpenoid Saponin	Protoprimuloside B	
Mucilage		Expectorant
Acid	Malic acid	Diuretic
Tannin		Wound healing; antiinflammatory
Essential oil		
Seeds Also Contain		
Fatty acid	Gamma-linolenic acid	Antiinflammatory; antihypertensive
	Linoleic acid	
Oleic	Saturated	
Alkaloid, pyrrolizidine	Amabiline	Hepatotoxic
	Thesinine	

Client Considerations

Assess

- Assess the reason the client is using gamma linolenic acid.
- Assess for use of anticoagulants or antiplatelets. These should be avoided with GLA use.

Administer

- Keep gamma linolenic acid in a dry area, away from direct sunlight.

Teach Client/Family

- Teach the client that gamma linolenic acid should not be used in children or those who are pregnant or breastfeeding until more research is available.

Garcinia

(gar-sin-ee'uh)

Scientific names: *Garcinia cambogia, G. indica, G. hanburyi*

Other common names: Camboge, gorikapuli, gutta cambodia, HCA, hydroxycitric acid, malabar tamarind, tom rong

Origin: *Garcinia cambogia* comes from the Indian brindall berry.

Uses

Traditionally, garcinia is used for constipation because it possesses a strong laxative effect.

Investigational Uses

New studies are underway using garcinia for weight loss and hyperlipidemia.

Actions

There is little research for garcinia's use in weight loss. One small study (Heymsfield et al, 1998) identified its use to reduce fatty acid synthesis and food intake and thus reduction in weight. In another study (Mahendran et al, 2002), rats with indomethacin-induced gastric ulcers showed improvement when fed *G. cambogia.* Garcinia has been shown to lower the formation of low-density lipoprotein and triglycerides (Adaramoye et al, 2006; Jellin et al, 2008). The effect of kolaviron, a seed extract, is hypocholesterolemic, and reduction of the weight of the heart in cholesterol-fed animals (Adaramoye et al, 2005).

Product Availability

Tablets, capsules, powder, and as a component in snack bars and breakfast bars. Garcinia may be standardized to a fixed HCA amount.

Plant Part Used: Ground drug from resin

Dosage

- Adult PO: 250-1000 mg tid

Contraindications

Garcinia should not be used in children or those who are pregnant, breastfeeding, hypersensitive, or who have renal/hepatic disease.

Side Effects/Adverse Reactions

GI: Severe diarrhea, abdominal pain, nausea, vomiting
SYST: *Death (>4 g of herb)*

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Resins	Benzophenones	
Xanthones	Gambogin; Morelin dimethyl acetal; Isomoreolin B; Moreolic acid; Gambogenic acid; Gambogenin; Isogambogenin; Desoxygambogenin; Gambogenin dimethyl acetal; Isomorellin; Morellic acid; Desoxymorellin	Cytotoxic (Asano et al, 1996)
Mucilages		

Client Considerations

Assess

- Assess the reason the client is using garcinia.
- Monitor weight while taking this product.

Administer

- Keep garcinia in a dry area, away from direct sunlight.

Teach Client/Family

- Teach the client that garcinia should not be used in children or those who are pregnant or breastfeeding until more research is available.
- Advise the patient that the herb should be used under the supervision of a qualified herbalist because overdose can cause death.

Garlic

(gahr'lik)

Scientific name: *Allium sativum*

Other common names: Ail, allium, camphor of the poor, da-suan, knoblauch, la-suan, nectar of the gods, poor-man's treacle, rustic treacle, stinking rose

Origin: Garlic is a perennial bulb found throughout the world.

Uses

Garlic is used as an antilipidemic, antimicrobial, antiasthmatic, and antiinflammatory. It is a possible antihypertensive agent and is used to treat some types of heavy metal poisoning.

Investigational Uses

Studies are underway to determine the role of garlic as an anticancer, antioxidant, antiplatelet, and antidiabetic.

Actions

The main actions attributed to garlic are antimicrobial, antilipidemic, antitriglyceride, antiplatelet, antioxidant, and cancer preventive.

Antimicrobial Action

A study using aqueous extracts of garlic in vitro showed that garlic inhibits both gram-positive and gram-negative organisms (Sovova et al, 2002). Other studies have demonstrated the antimicrobial action of garlic against *Mycobacterium tuberculosis* (Hughes et al, 1991), *Staphylococcus aureus* (Gonzalez-Fandos et al, 1994), *Candida* sp (Shams-Ghahfarokhi, 2006), and multidrug-resistant *Streptococcus mutans* (Fani et al, 2007). Between 1983 and the present, various studies identified the antifungal, antiviral, and antiparasitic actions of garlic.

Cardiovascular Action

Garlic has been shown to exert cholesterol-lowering, triglyceride-lowering, and antiplatelet actions.

Cholesterol-Lowering and Triglyceride-Lowering Actions

In one study, the cholesterol-lowering action of garlic was equal to that of bezafibrate, a prescription drug available in Germany (Holzgartner et al, 1992). However, results of other studies have been mixed. One study showed no difference in cholesterol levels between the experimental and the control group (Neil et al, 1996). However, another study showed an 11% reduction in the cholesterol levels of male subjects after 12 weeks of garlic treatment (Adler et al, 1997). The chemical component believed to be responsible for the anticholesterol action is allicin, which is believed to reduce cholesterol production by preventing gastric lipase fat digestion and fecal excretion of sterols and bile acids (Gebhardt, 1993).

Antiplatelet Action

The antiplatelet effect of garlic has been demonstrated, with ajoene apparently functioning as the chemical component responsible (Apitz-Castro et al, 1994). Several investigations have demonstrated the ability of garlic to reduce platelet aggregation and cyclooxygenase (Ali, 1995; Apitz-Castro et al, 1994; Bordia et al, 1996). Among the documented results are improved circulation, decreased atherosclerosis, and improved intermittent claudication.

Cancer Prevention

A large amount of evidence is available to support the beneficial effects of garlic in the prevention of cancer and the slowing of its progression. There may be a decrease in the development of gastric cancer when garlic is added to the diet. Another study has shown that the addition of vegetables in the *Allium* genus (onions, leeks, garlic) to the diet prevents gastric cancer (Dorant et al, 1996). The protective effects may be due to the antioxidant properties of these vegetables and their ability to inhibit cancer cell proliferation.

Other Actions

Garlic has been shown to inhibit free radicals, which may be responsible for cancer proliferation, and to decrease lipid peroxidation (Rietz et al, 1995). Other actions have been proposed, such as the hypoglycemic effects of garlic and its role as a protectant against lead, cadmium, and radiation poisoning, but to date little research supports these claims.

Product Availability

Bulbs, capsules, extract, fresh garlic, oil, powder, syrup, tablets, tea

Plant Part Used: Bulb (root)

Dosages

Garlic may be standardized to its allicin (active ingredient) content.

Chronic Candidiasis

- Adult PO fresh garlic: 4 g daily (Murray, Pizzorno, 1998)

General Use

- Adult PO extract, aged: 4 ml daily (McCaleb et al, 2000)
- Adult PO fresh garlic: 4 g daily (Blumenthal, 1998; McCaleb et al, 2000)
- Adult PO oil, perles: 10 mg daily (McCaleb et al, 2000)

Hypercholesteremia/Hypertension

- Adult PO: 40,000 mcg daily (allicin) (Murray, Pizzorno, 1998)
- Adult PO capsules/powder/tablets: 600-900 mg daily in divided doses to decrease lipids (McCaleb et al, 2000)

General Use

- Child PO fresh garlic: ½-3 cloves daily (Romm, 2000)
- Child PO syrup: ½-1 tsp/day (Romm, 2000)
- Child PO tea: 1 cup daily; may give up to 4 cups daily to treat colds (Romm, 2000)

Contraindications

Pregnancy category is 1; breastfeeding category is 2A.

Because garlic may reduce iodine uptake, it should not be used by persons with hypothyroidism. Because garlic may cause clotting time to be increased, it should not be used by persons who recently have had or are about to have surgery. Garlic should not be used by persons with stomach inflammation, gastritis, or hypersensitivity to this herb.

Side Effects/Adverse Reactions

CNS: Dizziness, headache, irritability, fatigue, insomnia
CV: Tachycardia, orthostatic hypotension
GI: Nausea, vomiting, anorexia
GU: Hypothyroidism
INTEG: Hypersensitivity reactions, contact dermatitis
RESP: Asthma, shortness of breath
SYST: Diaphoresis, garlic odor, irritation of the oral cavity, decreased red blood cells, hypothyroidism

Interactions

Drug

Anticoagulants *(anisindione, dicumerol, heparin, warfarin),* ***antiplatelets, NSAIDs, salicylates:*** Garlic may increase bleeding when used with these products; do not use concurrently.

Antidiabetics *(acetohexamide, chlorpropamide, glipizide, metformin, tolazamide, tolbutamide, troglitazone):* Because of the hypoglycemic effects of garlic, oral antidiabetic dosages may need to be adjusted.

Continued

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Interactions—cont'd

Cytochrome P4503A4 substrates: Garlic containing allicin may increase the action of cytochrome P4503A4.

Hormonal contraceptives, nonnucleoside reverse transcriptase inhibitors: Garlic with allicin may decrease the action of hormonal contraceptives, nonnucleoside reverse transcriptase inhibitors.

Insulin: Because of the hypoglycemic effects of garlic, insulin dosages may need to be adjusted.

Herb

Acidophilus: Acidophilus may decrease the absorption of garlic. If taken concurrently, separate the dosages by 3 hours.

Anticoagulant/antiplatelet, fish oils herbs: Garlic used with herbs having anticoagulant/antiplatelet properties may increase risk of bleeding.

Lab Test

LDL, platelet aggregation, triglycerides, blood lipid profile: Garlic may decrease LDL cholesterol (aged extract taken continuously), platelet aggregation (aged extract of garlic taken over extended period of time), triglycerides (aged extract of garlic taken over extended period of time), blood lipid profile.

Prothrombin time INR, APTT, serum IgE: Garlic may increase prothrombin time, INR, APTT and serum immunoglobulin E (IgE).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil	Alliin Allicin	Antiplatelet, anticoagulant
Alliinase		
Ajoene		Antiplatelet, anticoagulant
Terpene	Citral; Geraniol; Linalool	
Diallyl sulfide		
Vitamin	A; B; C; E	
Mineral	Selenium Germanium; Zinc; Magnesium	Antioxidant
Amino acid		
Glycoside		

Client Considerations

Assess

- Assess the reason the client is using garlic.
- Because garlic is a common allergen, assess for hypersensitivity reactions and contact dermatitis. If such reactions are present, discontinue the use of garlic and administer an antihistamine or other appropriate therapy.
- Assess lipid levels if the client is using garlic to decrease lipids.
- Monitor CBC and coagulation studies if the client is using garlic at high doses or with anticoagulants. Identify anticoagulants the client is using, including salicylates (see Interactions).

- Determine whether the client is diabetic and is using insulin or antidiabetics; dosages may need to be adjusted (see Interactions).

Administer

- Instruct the client to avoid the daily use of medicinal garlic, unless under the supervision of a qualified herbalist. Blood clotting may be affected.
- Instruct the client to store garlic products in a sealed container away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 1 and breastfeeding category is 2A.
- Inform the client that some studies have indicated that garlic may be helpful in treating children with hypercholesterolemia (McCindle, Connor, 1998).
- Advise the client to inform all health care providers of garlic use.
- Caution the client to discontinue the use of garlic before undergoing any invasive procedure in which bleeding may occur.

Gentian

(jehn'shuhn)

Scientific names: *Gentiana lutea* L., *Gentiana acaulis* L.

Other common names: Bitter root, bitterwort, feltwort, gall weed, pale gentian, stemless gentian, yellow gentian

Origin: Gentian is a flowering perennial found in Europe and Asia.

Uses

Gentian has been used to stimulate the appetite and to treat digestive disorders such as colitis, irritable bowel syndrome, colic, gallstones, biliary pain, peptic ulcer, and heartburn. It is also used as a component in alcoholic beverages (bitters).

Actions

Very little primary research is available for gentian. It is typically used to stimulate the appetite and is usually mixed in alcoholic products. However, no studies support this use. Several of the chemical components, gentiopicroside, sweroside, and swertiamerine; secoiridoids are responsible for the wound-healing properties of gentian (Oztürk et al, 2006).

Product Availability

Fluid extract, infusion, root, tea, tincture

Plant Parts Used: Rhizome, roots

Dosages

- Adult PO fluid extract: 2-4 g daily (Blumenthal, 1998)
- Adult PO infusion: no dosage consensus
- Adult PO root: 2-4 g daily (Blumenthal, 1998)
- Adult PO tea: Place ½ tsp in 4 oz water, boil and strain, take tid before meals
- Adult PO tincture: 1-3 g daily (Blumenthal, 1998); 2 ml tid (1:5 dilution) (Mills, Bone, 2000)

Contraindications

Pregnancy category is 3; breastfeeding category is 2A.
Gentian should not be given to children. It should not be used by persons with hypersensitivity to this herb, those with stomach irritability or inflammation, or those with stomach or duodenal ulcers.

Side Effects/Adverse Reactions

CNS: Headache
GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions

Interactions

Drug

Antacids, H_2-blockers, proton pump inhibitors: Gentian may decrease the action of these agents (theoretical) (Jellin et al, 2008).
Iron salts: Gentian may interfere with absorption of iron salts; separate by at least 2 hours.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloids	Gentiopicrin Gentiamarin Gentiin Gentisin Gentianose	Increased salivation, digestive juice secretions
Gentisic acid		
Amarogentin		
Gentiopicroside, Swertiamarin, Sweroside		Wound healing
Xanthones		
Tannins		
Volatile oil		
Isoorientin		Hypoglycemic (Sezik et al, 2005)

Client Considerations

Assess

- Assess the reason the client is using gentian.
- Assess for hypersensitivity reactions. If present, discontinue use of this herb and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store gentian products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 2A.
- Caution the client not to give gentian to children.

Ginger

(jin′ juhr)

Scientific name: *Zingiber officinale*

Other common names: Black ginger, race ginger, zingiber

Origin: Ginger is found in the tropics of Asia and is now cultivated in the tropics of South America, China, India, Africa, the Caribbean, and parts of the United States.

Uses

Ginger is used to prevent and relieve motion and morning sickness; to relieve sore throat, nausea, and vomiting; to treat migraine headaches; and as an antioxidant.

Investigational Uses

Preliminary research is available that documents the efficacy of ginger in decreasing the pain and inflammation associated with arthritis and other joint disorders. Some evidence indicates that it may also reduce platelet aggregation. Ginger may decrease hyperglycemia, ulcers, and fever.

Actions

Antiemetic and Antinausea Actions

Several studies have documented the antiemetic and antinausea actions of ginger. When dried ginger powder was evaluated against dimenhydrinate and a placebo, ginger was found to reduce nausea and vomiting more effectively than dimenhydrinate (Mowrey et al, 1982). This effect is postulated to result from action on the digestive tract instead of the central nervous system. Ginger lacks any anticholinergic effects. Since these studies were completed, several other studies have also confirmed the antiemetic and antinausea effects of ginger.

Antiinflammatory Action

In one study, the ability of ginger to decrease induced paw edema in laboratory animals was equal to that of aspirin. Its ability to inhibit arachidonic acid metabolism is believed to be responsible. Ginger has been used in traditional medicine to treat rheumatic disorders.

Other Actions

Other actions for ginger include antiulcer, antiplatelet, antipyretic, antiinfective, antioxidant, and antidiabetic action; improved digestive function and positive inotropic action.

Improved Digestive Functioning

Improved digestive functioning may occur as a result of increased amylase and salivary production. Ginger has been shown to increase the absorption of other drugs and to prevent degradation during the first hepatic pass (Chang et al, 1987).

Antiulcer Action
The antiulcer effects of ginger may be due to two of its chemical components, gingerol and gingesulphonic acid. Improvements in ulcer patients occurred with the use of ginger decocted in water. However, relapse was common, and complete cure did not occur (Chang et al, 1987).

Antiplatelet Action
The antiplatelet action of ginger may be a result of the inhibition of thromboxane formation. Increases occurred in ADP, collagen, arachidonic acid, and epinephrine when ginger was used.

Antipyretic Action
The antipyretic effect of ginger is due to its prostaglandin inhibition. Ginger is as effective as aspirin in reducing fever (Mascolo et al, 1989).

Antiinfective Action
Ginger exerts antiinfective action against both gram-positive and gram-negative bacteria. Its antiinfective action was very weak when tested; however, one class of chemical components, the sesquiterpenes, did exert significant action against antirhinoviral infections (Denyer et al, 1994).

Antioxidant Action
The antioxidant effects of ginger may be the result of the actions of gingerol and zingerone, two of its chemical components. These components inhibit lipoxygenase and eliminate the radicals superoxide and hydroxyl (Cao et al, 1993). Another study (Ahmed et al, 2000) identified a significant lowered lipid peroxidation by maintaining activities of the antioxidant enzymes, again strengthening the supportive evidence for use of ginger as an antioxidant.

Antidiabetes Action
Ginger may be useful in the treatment of hyperglycemia. Rabbits treated with ginger exhibited a hypoglycemic effect (Mascolo et al, 1989).

Positive Inotropic Action
In one study, the cardiovascular actions of ginger included a positive inotropic effect. When subjects were asked to chew fresh ginger, their blood pressure increased. This action resulted from the pressor response, but it was short term (Chang et al, 1987).

Radioprotection Action
One study showed radiation protection when the extract was used. Ginger extract was given 1 hour before radiation and showed significant blocking of the effects of radiation (Haksar et al, 2006).

Product Availability
Capsules, dried root, extract, fresh root, powder, tablets, tea, tincture

Plant Part Used: Rhizome

Dosages
Ginger may be standardized to its volatile oil (4%) or essential oil (8%).

General Use
- Adult PO dried ginger capsules: 1 g/day (McCaleb et al, 2000)
- Adult PO dried root equivalent: 500 mg bid-qid (Mills, Bone, 2000)
- Adult PO fluid extract: 0.7-2 ml/day (1:2 dilution) (Mills, Bone, 2000)
- Adult PO fresh root equivalent: 500-1000 mg tid (Mills, Bone, 2000)
- Adult PO tablets/caps: 500 mg bid-qid (Mills, Bone, 2000)
- Adult PO tincture: 1.7-5 ml/day (1:5 dilution) (Mills, Bone, 2000)

Migraine
- Adult PO dried ginger: 500 mg qid
- Adult PO extract: 100-200 mg, standardized to 20% ginerol and shogol
- Adult PO fresh ginger: 10 g/day (¼-inch slice) (Murray, Pizzorno, 1998)

Motion Sickness and Morning Sickness Prevention
- Adult PO extract: 100-200 mg, standardized to 20% ginerol and shogol
- Adult PO powder: 1-2 g ½-1 hr before traveling or upon arising
- Adult PO tea, dried root: 1½ tsp ground dried root in 1 cup water, boil 5-10 min, drink prn
- Adult PO tea, fresh root: 1 tsp fresh root in 1 cup water, infuse 5 min, drink prn

Rheumatoid Arthritis
- Adult PO extract: 100-200 mg, standardized to 20% ginerol and shogol (Murray, Pizzorno, 1998)
- Adult PO fresh ginger: 8-10 g/day (Murray, Pizzorno, 1998)

Sore Throat
- Adult PO fresh root tea: 1 tsp fresh root in 1 cup water, infuse 5 min, gargle prn (Murray, Pizzorno, 1998)

General Use
- Child PO ginger root tea: ¼-1 cup prn (Romm, 2000)
- Child PO tincture: 5-25 drops in water prn (Romm, 2000)

Contraindications
Pregnancy category is 1; breastfeeding category is 2A.
Ginger should not be used by persons with hypersensitivity to it. Unless directed by a physician, ginger should not be used by persons with cholelithiasis.

Side Effects/Adverse Reactions
CV: *Arrhythmias*
GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions

Interactions
Drug
All oral medications: Ginger may increase absorption of all medications taken orally.
Antacids, antidiabetics, antihypertensives, H_2-blockers, proton pump inhibitors: Ginger may decrease the action of these agents (theoretical) (Jellin et al, 2008).
Anticoagulants *(ardeparin, anisindione, aspirin, dicumerol, dalteparin, heparin, warfarin),* ***antiplatelets*** *(abciximab):* Ginger may increase the risk for bleeding when used concurrently with anticoagulants, antiplatelets (theoretical).
Herb
Anticoagulant/antiplatelet herbs: When used with anticoagulant/antiplatelet herbs, ginger may increase the risk for bleeding (theoretical) (Jellin et al, 2008).
Lab Test
Plasma partial prothrombin time, prothrombin time: Ginger may increase plasma partial prothrombin time in clients taking warfarin concurrently and may increase prothrombin time.

Pharmacology

Pharmacokinetics

Information on the pharmacokinetics and pharmacodynamics of ginger is limited. Its metabolites are known to be eliminated via urinary excretion within 24 hours, and it is 90% bound to plasma proteins.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Pungent	Gingerol	Antioxidant; antiulcer, cardiotonic
	Zingerone	Antioxidant
	Shogaol	
Volatile oil	Bisabolene; Zingiberene; Zingiberol	Antimicrobial
Proteolytic enzyme		
Gingesulphonic acid		Antiulcer
Sesquiterpene		Antiviral

Client Considerations

Assess

- Assess the reason the client is taking ginger.
- Assess for hypersensitivity reactions. If present, discontinue use of this herb and administer an antihistamine or other appropriate therapy.
- Assess all medications used (see Interactions).

Administer

- Instruct the client to store ginger products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 1 and breastfeeding category is 2A.

Ginkgo

(ging'koe)

Scientific name: *Gingko biloba*

Other common names: Maidenhair tree, rokan, sophium, tanakan, tebofortan, tebonin

Origin: Ginkgo is a tree native to China and Japan. It is now also found in the United States and Europe.

Uses

Gingko is used to decrease disturbances of cerebral functioning and peripheral vascular insufficiency in persons with Alzheimer's disease or other types of age-related dementia. It is also used as an antioxidant, to improve peripheral artery

disease, and to enhance circulation throughout the body. Other reported uses include the treatment of depressive mood disorders, sexual dysfunction, asthma, glaucoma, menopausal symptoms, multiple sclerosis, headaches, tinnitus, dizziness, arthritis, altitude sickness, and intermittent claudication.

Actions

Much research is available documenting the uses and actions of *Ginkgo biloba* L. Ginkgo has been used in China since ancient times. Initial research began in Europe in the 1960s.

Cognitive Enhancement Action

The cognitive enhancement action of ginkgo is a result of the flavonoids present in the extract. The pharmacologic actions involve increased release of neurotransmitters, including catecholamines, and inhibition of monoamine oxidase. Approximately 50 controlled studies between 1975 and 1997 have demonstrated the positive effects of gingko in the treatment of cerebral insufficiency. All studies incorporated various dosages and varying lengths of treatment, and all results were positive. However, newer studies have questioned the benefit of ginkgo for cognitive function (Carlson et al, 2007; Mazza et al, 2006).

Vasoprotective and Tissue-Protective Actions

The vasoprotective and tissue-protective actions of ginkgo result from several factors: its ability to relax blood vessels, to protect against capillary permeability, to inhibit platelet aggregation, and to decrease ischemia and edema. Studies have confirmed this effect in rabbits (Monboisse et al, 1993).

Other Actions

Gingko has been studied for its antioxidant effects, its relief of altitude sickness, its antiarthritic and analgesic effects, and its relief of ischemia in intermittent claudication.

Antioxidant Action

Gingko has been studied for its antioxidant effects. It has been found to eliminate free radicals and is able to inhibit polymorphonuclear neutrophils (Monboisse et al, 1993).

Altitude Sickness Relief

Ginkgo can relieve altitude sickness. One study involving two groups of mountain climbers focused on the effects of gingko when traveling to high altitudes. One group took 160 mg of gingko daily while climbing, and the other received a placebo. Both groups ascended to 14,700 feet and made other ascents from that point. None of the gingko group reported full-blown altitude sickness, whereas 82% of the placebo group did (Feng et al, 1989). Another study (Gertsch et al, 2002) was designed to identify the time needed to prevent acute mountain sickness. One day of pretreatment with ginkgo 60 mg tid significantly reduced the severity of acute mountain sickness. However, a newer study found no benefit in using ginkgo to prevent altitude sickness (Chow et al, 2005).

Antiarthritic and Analgesic Actions

Ginkgetin, a chemical component of gingko, has been studied for its antiarthritic and analgesic effects. Ginkgetin given in dosages of 10-20 mg/kg/day reduced arthritic inflammation in laboratory animals by 86% at the highest dose given (Kim et al, 1999).

Product Availability

Capsules, fluid extract, tablets, tincture

Plant Part Used: Leaves

Dosages

Ginkgo may be standardized to 24% ginkgo flavonglycosides and 6% terpene trilactones.

Alzheimer's Disease

- Adult PO capsules/extract/tablets: 80 mg tid standardized to 24% flavonglycosides (Murray, Pizzorno, 1998)

Asthma

- Adult PO extract: 80 mg tid (Murray, Pizzorno, 1998)

Cerebral Vascular Insufficiency

- Adult PO extract: 80 mg tid standardized to 24% flavonglycosides (Murray, Pizzorno, 1998)

General Use

- Adult PO standardized extract: 40 mg tid

Glaucoma

- Extract: 40-80 mg tid standardized to 24% flavonglycosides (Murray, Pizzorno, 1998)

Impotence from Arterial Insufficiency

- Adult PO extract: 80 mg tid standardized to 24% flavonglycosides (Murray, Pizzorno, 1998)

Menopause

- Adult PO extract: 40 mg tid standardized to 24% flavonglycosides (Murray, Pizzorno, 1998)

Multiple Sclerosis

- Adult PO extract: 40-80 mg tid standardized to 24% flavonglycosides (Murray, Pizzorno, 1998)

Contraindications

Pregnancy category is 2; breastfeeding category is 1A.
Ginkgo should not be given to children. It should not be used by persons with coagulation or platelet disorders, hemophilia, seizures, or hypersensitivity to this herb.

Side Effects/Adverse Reactions

CNS: Transient headache, anxiety, restlessness
GI: Nausea, vomiting, anorexia, diarrhea, flatulence
INTEG: Hypersensitivity reactions, rash

Interactions

Drug

Anticoagulants *(anisindione, dalteparin, dicumerol, heparin, salicylates, warfarin),* ***platelet inhibitor*** *(abciximab),* ***salicylates:*** Because of the increased risk of bleeding, ginkgo should not be taken concurrently with these products.
Anticonvulsants *(carbamazepine, gabapentin, phenobarbital, phenytoin):* Ginkgo components may decrease the anticonvulsant effect; avoid concurrent use.

Interactions—cont'd

Buspirone, fluoxetine: Ginkgo given with these agents may cause hypomania (Jellin et al, 2008).
Cytochrome P450IA2/P4502D6/P4503A4 substrates: Ginkgo may affect drugs metabolized by these agents; use caution if giving concurrently (Jellin et al, 2008).
MAOIs: MAOI action may be increased if taken with ginkgo; do not use concurrently (theoretical).
SSRIs: Ginkgo is often used to reverse the sexual side effects of SSRIs.
Trazadone: Ginkgo with trazadone may cause coma (Jellin et al, 2008).

Herb

Anticoagulant/antiplatelet herbs: Ginkgo may increase the risk of bleeding when used with these herbs (Jellin et al, 2008).
St. John's wort: Ginkgo with St. John's wort can lead to hypomania.

Lab Test

Partial thromboplastin time, ASA tolerance test: Ginkgo may cause increased bleeding (partial thromboplastin time, ASA tolerance test).
Platelet activity: Ginkgo may decrease platelet activity.
Prothrombin time, blood salicylate: Ginkgo may increase prothrombin time and blood salicylate.

Pharmacology

Pharmacokinetics

Excretion <30% of metabolites. Bioavailability is unaffected by food.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Flavonoid	Kaempferol; Quercetin Isorhamnetin; Myricetin	Antiinflammatory, antioxidant, cognitive enhancement
Diterpene	Ginkgolides	Platelet inhibitor; neuroprotective effects
Sesquiterpene	Bilobalide	
Triterpene	Sterols; Benzoic; Ginkgolic	Antioxidant
Ginkgetin		Antiinflammatory; antiarthritic

Client Considerations

Assess

- Assess the reason the client is using ginkgo.
- Assess for hypersensitivity reactions. If present, discontinue the use of this herb and administer an antihistamine or other appropriate therapy.
- Assess for the use of anticoagulants, platelet inhibitors, or MAOIs (see Interactions).

Administer

- Inform the client that ginkgo takes 1 to 6 months before it becomes effective.

Teach Client/Family

- Inform the client that pregnancy category is 2 and breastfeeding category is 1A.
- Caution the client not to give ginkgo to children.
- Caution the client not to use ginkgo with anticoagulants, platelet inhibitors, trazadone, or MAOIs.

Ginseng

(jin′sing)

Scientific names: *Panax quinquefolius, Panax ginseng*

Other common names: American ginseng, Asiatic ginseng, Chinese ginseng, five-fingers, Japanese ginseng, jintsam, Korean ginseng, ninjin, Oriental ginseng, schinsent, seng and sang, tartar root, Western ginseng

Origin: Ginseng is now found throughout the world. *Panax quinquefolius* is native to North America; *Panax ginseng* is native to the Far East.

Uses

Ginseng has been used for a variety of purposes for about 5000 years. It has been used to increase physical endurance and lessen fatigue, to improve the ability to cope with stress, and to improve concentration. It also may improve overall well-being. Many herbalists consider it a tonic.

Investigational Uses

Initial research is exploring the use of ginseng to improve cognitive functioning and to treat diabetes mellitus, hyperlipidemia, seizure disorders, cancer, male infertility, male erectile dysfunction, emphysema, and rheumatoid arthritis and to enhance immunity.

Actions

Most of the available research on ginseng comes from Asia, where this herb has been studied extensively. Investigators have completed research on the ability of ginseng to decrease fatigue, increase physical performance, and improve mental functioning. Studies have also been done on its anticancer and antidiabetes effects.

Decreased Fatigue, Increased Physical Performance, and Improved Mental Function

Decreased Fatigue

One study used a questionnaire to identify participants with fatigue. The subjects were treated with either ginseng or a placebo. Results showed significant improvement in fatigue with the use of ginseng as compared with the use of a placebo (Le Gal et al, 1996).

Increased Physical Performance

Studies using both human subjects and laboratory animals indicate that ginseng increases physical performance. In one study, male athletes took 200 mg of standardized ginseng daily. Their performance increased significantly, as demonstrated by measurements including increased oxygen utilization and improved reaction time (Forgo et al, 1985).

Improved Mental Function

In both animal and human studies, ginseng has been shown to improve mental functioning.

Anticonvulsant Action

Generalized tonic-clonic convulsions were induced in rats by chemical means, then *Panax ginseng* was given to one group every day: 100 mg/kg ½ hour before administration of convulsive chemical (Gupta et al, 2001). There was significant protection in the group treated with *Panax ginseng. Panax ginseng* may show promise as an anticonvulsant.

Anticancer Action

A significant reduction in cancer risk occurred when a large group of human subjects was divided into control and experimental groups, matched for multiple risk factors, and given ginseng. Those taking ginseng had a lower cancer risk than those in the control group (Yun et al, 1990). Also, long-term administration of ginseng inhibits tumor growth.

Antidiabetic Action

Ginseng has been used for centuries to treat diabetes mellitus. Its antidiabetic action results from the chemical components from adenosine, known as panaxans, and others (Ng et al, 1985). Ginseng has shown glucoregulating properties even when administered with glucose (Liu et al, 2005; Reay et al, 2006).

Product Availability

Capsules, dried root used for decoction, extract, powder, standardized extract, tea, tincture; may be found in creams and lotions used to treat wrinkles

Plant Part Used: Roots

Dosages

Standardized extracts contain 5% ginsenosides (an aglycone chemical component believed to act as a stimulant).

General Use

- Adult PO capsules: 200-500 mg extract daily (Blumenthal, 1998)
- Adult PO infusion: pour boiling water over 3 g herb, let stand 10 min, strain; may be taken tid for 3-4 wk
- Adult PO powdered root: 1-4 g daily
- Adult PO standardized extract: 200-500 mg daily (Blumenthal, 1998)
- Adult PO tincture: 1-2 ml extract daily (1:1 dilution) (Blumenthal, 1998)

Male Infertility

- Adult PO crude herb (root, high quality): 1.5-2 g tid (Murray, Pizzorno, 1998)
- Adult PO extract: 100-200 mg tid standardized to 5% ginsenosides (Murray, Pizzorno, 1998)

Rheumatoid Arthritis

- Adult PO crude herb: 4.5-6 g/day in divided doses
- Adult PO extract: 500 mg daily-tid

Attention Deficit Hyperactivity Disorder

- Child PO: 200 mg bid in combination with *ginkgo biloba* × 4 wk

Contraindications

Pregnancy category is 1; breastfeeding category is 2A.
Ginseng should not be given to children. It should not be used by persons with hypertension, cardiac disorders, or hypersensitivity to it. If breast cancer or other estrogen-dependent conditions are present, ginseng should not be used.

Side Effects/Adverse Reactions

CNS: Anxiety, insomnia, restlessness (high doses), headache
CV: Hypertension, chest pain, palpitations, decreased diastolic blood pressure, increased QTc interval.
GI: Nausea, vomiting, anorexia, diarrhea (high doses)
Ginseng Abuse Syndrome: *Edema, insomnia, hypertonia*
INTEG: Hypersensitivity reactions, rash

Interactions

Drug

Anticoagulants *(anisindione, dicumarol, heparin, warfarin),* ***antiplatelets, salicylates:*** Ginseng may decrease the action of these products.
Anticonvulsants: Ginseng may provide an additive anticonvulsant action (theoretical).
Antidiabetics *(acetohexamide, chlorpropamide, glipizide, metformin, tolazamide, tolbutamide, troglitazone):* Because ginseng is known to decrease blood glucose levels, it may increase the hypoglycemic effect of antidiabetics; avoid concurrent use.
Immunosuppressants *(azathioprine, basiliximab, cyclosporine, daclizumab, muromonab, mycophenolate, tacrolimus):* Ginseng may diminish the effect of immunosuppressants; do not use immediately before, during, or after transplant surgery.
Insulin: Because ginseng is known to decrease blood glucose levels, it may increase the hypoglycemic effect of insulin; avoid concurrent use.
MAOIs *(isocarboxazid, phenelzine, tranylcypromine):* Concurrent use of MAOIs with ginseng may result in manic-like syndrome.
Stimulants: Use of stimulants (e.g., xanthines) concurrently with ginseng is not recommended; overstimulation may occur.

Herb

Caffeine, guarana, yerba maté, tea: Ginseng with these agents may lead to added stimulation (Jellin et al, 2008).
Ephedra: Concurrent use of ephedra and ginseng may increase hypertension and central nervous system stimulation; avoid concurrent use.

Food

Caffeinated coffee, cola, tea: Overstimulation may occur when ginseng is used with caffeinated coffee, cola, and tea; avoid concurrent use.

Lab Test

Blood glucose: Ginseng may decrease blood glucose (decoctions, infusions).
Plasma partial thromboplastin time, INR: Ginseng may increase plasma partial thromboplastin time and INR.
Serum, urine estrogens: Ginseng may have an additive effect on serum and 24-hour urine estrogens.
Serum digoxin: Ginseng may falsely increase serum digoxin.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Triterpene saponin	Ginsenosides	Stimulant inhibits platelet activating factor, anticancer, CNS depressant, anticonvulsant
Sesquiterpene		
Polyacetylenes	Falcarinol; Falcarintriol	
Polysaccharide	Panaxans A-U	Antidiabetes
Adenosine		Antidiabetes
Essential oil		
Peptides		

Client Considerations

Assess

- Assess the reason the client is using ginseng.
- Assess for hypersensitivity reactions and rash. If these are present, discontinue the use of this herb and administer an antihistamine or other appropriate therapy.
- Assess for ginseng abuse syndrome: insomnia, edema, and hypertonia.
- Assess for the use of stimulants, anticoagulants, MAOIs, and antidiabetics (see Interactions).

Administer

- Instruct the client to store ginseng products in a cool, dry place, away from heat and moisture.
- Instruct the client to avoid the continuous use of ginseng. The recommendation is to use this herb for no more than 3 continuous months, taking a break between courses (Mills, Bone, 2000).

Teach Client/Family

- Inform the client that pregnancy category is 1 and breastfeeding category is 2A.
- Caution the client not to give ginseng to children.
- Advise the client to use other stimulants and antidiabetics carefully if taking concurrently with ginseng (see Interactions).
- Warn the client of the life-threatening side effects of ginseng abuse syndrome.
- Instruct the client that *Siberian ginseng* and *Panax ginseng* are not the same.

Glossy Privet

(gloss′ ee priv′ et)

Scientific name: *Ligustrum lucidum*

Other common names: Chinese privet, dongquingzi, nu zhen, nuzhenzi, privet

Origin: Glossy privet originates from China.

Uses

Traditionally, glossy privet has been a part of Chinese medicine and is used for palpitations, colds, congestion, darkening hair, and reducing age spots, and the effects of chemotherapy.

Actions

There is very little research for use of glossy privet in any conditions; most information comes from anecdotal information. One of glossy privet's chemical components, oleanolic acid, has shown hypoglycemic and hypolipidemic actions (Gao et al, 2007).

Product Availability

Powdered berries

Plant Part Used: Berries

Dosages

- Adult PO: 5-15 g of powdered berries per day
- Adult PO tea: steep 2-5 g powdered berries in 1 cup boiling water

Contraindications

Glossy privet should not be used in children or those who are pregnant, breastfeeding, or hypersensitive to this product.

Side Effects/Adverse Reactions

SYST: Allergic reactions

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Flavonoids	Apigenin, Cosmosiin, Apigenin-7, Lutinoside, Luteolin, Quercetin (Xu et al, 2007)	
Triterpenoids		
Glycosides		
Mannitol		
Oleanolic acid		Hypoglycemic, hypolipidemic

Client Considerations

Assess

- Assess the reason the client is using glossy privet.

Administer

- Keep glossy privet in a dry area, away from direct sunlight.

Teach Client/Family

- Teach the patient that glossy privet should not be used in children or those who are pregnant or breastfeeding until more research is available.
- Advise the client that if allergic reactions occur, stop using the product.

= Pregnancy = Pediatric = Alert = Popular Herb

Glucomannan

(glew-koe-man′uhn)

Scientific name: *Amorphophallus konjac*

Other common names: Konjac, konjac mannan

Origin: Glucomannan is purified from konjac flour by chemical processing.

Uses

Glucomannan is useful as a bulk laxative.

Investigational Uses

Researchers are studying glucomannan for its lipid-lowering action and antidiabetic effects. Glucomannan has also shown some efficacy in promoting weight loss.

Actions

Because some of the chemical components are the same (mannose and a similar polysaccharide, galactose), glucomannan has many of the same properties as guar gum. For this reason, the actions of guar gum and glucomannan may be expected to be the same. Glucomannan has been used as an antidiabetic and anticholesteremic agent, an aid to weight reduction, and a laxative. There is beginning research to suggest glucomannan possesses antibacterial proteins (Zhou et al, 2007).

Antidiabetes Action

Glucomannan has been shown to delay absorption of glucose from the intestine. In one study in which diabetic clients received glucomannan for 3 months, fasting blood glucose levels decreased by approximately one third, and dosages of antidiabetic agents were able to be reduced (Doi et al, 1979).

Anticholesteremic Action

In one study using laboratory rats, cholesterol levels were reduced when glucomannan was added to the rats' diet (Kiriyama, 1969). When overweight individuals with high cholesterol levels were given 100 ml of a 1% glucomannan solution for 11 weeks, cholesterol levels decreased by a mean of 18%. In another study, men's cholesterol levels decreased by approximately 10% (Arvill et al, 1995).

Weight Reduction

Results have been mixed when glucomannan is used for weight reduction. One study showed a decrease in weight of 2.2 kg at the end of 2 months when 1.5 g of glucomannan was added to the diet twice a day (Reffo et al, 1990).

Laxative Action

Because the addition of water to the polysaccharides glucose and mannose causes them to swell, these substances are used as bulk laxatives. Viscosity of the intestinal contents is increased and gastric emptying is slowed. This may be of benefit for chronic constipation in neurologically impaired children (Staiano, 2000).

Product Availability

Capsules, powder, tablets

Plant Part Used: Tubers

Dosages

Diabetes Mellitus

- Adult PO capsules/tablets: up to 7.2 g daily; treatment of longer than 3 mo may be required

Lipid Lowering

- Adult PO capsules/tablets: no consensus on dosage

Weight Loss

- Adult PO capsules/tablets: 1 g tid 1 hr before meals

Contraindications

Until more research is available, glucomannan should not be used during pregnancy and breastfeeding. It should not be given to children. Persons with hypersensitivity to glucomannan should not use it.

Side Effects/Adverse Reactions

ENDO: Hypoglycemia
GI: Nausea, vomiting, anorexia, diarrhea, flatulence, cramping, dyspepsia, *gastrointestinal obstruction or perforation*
INTEG: Hypersensitivity reactions

Interactions

Drug

All medications: Glucomannan may decrease the absorption of medications if taken concurrently; separate dosages by at least 2 hours.
Antidiabetics, insulin: Glucomannan may increase the hypoglycemic effect of antidiabetics, insulin.
Antilipidemics: Glucomannan may increase the action of antilipidemics.

Herb

Hypoglycemic herbs: Glucomannan with other hypoglycemic herbs may increase hypoglycemia (Jellin et al, 2008).

Lab Test

Cholesterol, glucose, low-density lipoproteins: Glucomannan may decrease levels of these lab tests (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Polysaccharide	Mannose Glucose	Laxative; hypoglycemic; anticholesteremic, promotes hydration

Client Considerations

Assess

- Assess the reason the client is using glucomannan.
- Assess for hypersensitivity reactions. If present, discontinue the use of glucomannan and administer an antihistamine or other appropriate therapy.
- Assess for use of medications. Concurrent glucomannan use may decrease their absorption or increase their effects (see Interactions).

Administer

- Instruct the client to store glucomannan products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use glucomannan in children or those who are pregnant or breastfeeding until more research is available.
- Caution the client that gastrointestinal obstruction and perforation have occurred in conjunction with use of this product.

Glucosamine

(glew-koe'suh-meen)

Scientific name: 2-amino-2-deoxyglucose

Other common names: Chitosamine, GS

Origin: Glucosamine is found in mucopolysaccharides, chitin, and mucoproteins. Glucosamine is a naturally occurring substance; glucosamine sulfate is manufactured synthetically.

Uses

Glucosamine typically is used in conjunction with chondroitin to treat joint conditions such as those associated with arthritis.

Investigational Uses

Researchers are working to determine whether glucosamine may be effective in the treatment of diabetes mellitus.

Actions

Antiarthritic Action

The primary action of glucosamine is to protect against and prevent osteoarthritis. Several studies have focused on the results of glucosamine use as compared with that of nonsteroidal antiinflammatories and placebos. In one study more than 200 people were given either 500 mg of glucosamine or a placebo 3 times daily for 4 weeks. The experimental group showed significant improvement in movement and pain control (Noack et al, 1994). Another study comparing the benefits of glucosamine versus ibuprofen showed the two treatments to be equally effective after the second week of treatment. Study participants were then given 500 mg of glucosamine or 400 mg of ibuprofen 3 times daily for 4 weeks. The glucosamine group reported fewer side effects (Muller-Fassbender et al, 1994). A further study compared the effects of glucosamine and piroxicam. Subjects were given glucosamine, piroxicam, both, or a placebo for 3 months. The glucosamine group reported significant improvement as measured by the Lequesne index (Rovati et al, 1994). These results were achieved with fewer dropouts and fewer side effects. Studies are being added yearly that support the use of glucosamine in arthritic conditions (*Altern Med Rev,* 1999; Bruyere et al, 2007; Rubin et al, 2001; Towheed et al, 2005).

Product Availability

Capsules, tablets

Dosages

General Use

- Adult PO capsules/tablets: 1500 mg glucosamine and 1200 mg chondroitin for average-weight individuals; lower doses for underweight individuals; higher doses for overweight individuals

Osteoarthritis

- Adult PO capsules/tablets: 1500 mg/day (Murray, Pizzorno, 1998)

Contraindications

Until more research is available, glucosamine should not be used during pregnancy or breastfeeding. It should not be given to children because its effects on them are unknown. Glucosamine should not be used by persons with hypersensitivity to it.

Side Effects/Adverse Reactions

CNS: Drowsiness, headache
GI: Nausea, vomiting, anorexia, constipation or diarrhea, heartburn, epigastric pain and cramps, indigestion
INTEG: Hypersensitivity reactions, rash (rare)

Interactions

Drug

Anticoagulants, antiplatelets: Glucosamine and chondroitin at high levels can lead to bleeding risk (Jellin et al, 2008).
Antidiabetics: Glucosamine may increase the effects of antidiabetics (theoretical).

Lab Test

International Normalized Ratio (INR): Glucosamine and chondroitin in high doses may lead to increased INR (Jellin et al, 2008).

Pharmacology

Chemical Properties

Glucosamine sulfate is a synthetically manufactured product or derived from chitin (marine exoskeletons). Glucosamine is required for synthesis of certain proteins needed for tendons, ligaments, and cartilage.

Client Considerations

Assess

- Assess the reason the client is using glucosamine.
- Assess for hypersensitivity reactions, rash (rare). If these are present, discontinue use of glucosamine and administer an antihistamine or other appropriate therapy.
- Assess for joint pain, stiffness, and aggravating or ameliorating factors.
- Monitor blood glucose in diabetic patients (see Interactions).

Administer

- Instruct the client to take glucosamine PO with food to reduce gastric upset.
- Instruct the client to store glucosamine products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use glucosamine in children or those who are pregnant or breastfeeding until more research is available.
- Inform the diabetic client that glucosamine may lower blood glucose levels.

Glutamine

(gloo′ ta-men)

Scientific name: L-Glutamine

Other common name: Glutamine

Origin: Synthetic

Uses

Glutamine is used for digestive disorders, healing after illness, and infections after strenuous exercise.

Actions

There are few studies that support the use of glutamine in healing serious illnesses and infection after strenuous exercise. There is no supporting evidence for the use of glutamine in digestive disorders such as ulcerative colitis or Crohn's disease (Jellin et al, 2008). The beneficial effects of glutamine may depend on the route of administration. Studies on enteral or parenteral routes need to be completed (Vermenlen et al, 2007).

Product Availability

Tablets

Dosages

- Adult PO tablets: 2-6 g daily in divided doses

Contraindications

Glutamine should not be supplemented in pregnancy or breastfeeding. It should not be given to children.

Interactions

Drug

Anticonvulsants: Glutamine may decrease the anticonvulsant action of anticonvulsants; avoid concurrent use.

Client Considerations

Assess

- Assess the reason the client is using glutamine.
- Identify if the client is taking anticonvulsants that should not be taken with this product.

Administer

- Keep glutamine in a dry area, away from direct sunlight.

Teach Client/Family

- Teach the patient that glutamine should not be used in children and not supplemented in those who are pregnant or breastfeeding until more research is available.

Glycine

(gli' seen)

Uses

Glycine is used for CVA (stroke), schizophrenia, and to increase memory.

Actions

Glycine may augment heart transmission and modulate immune cell responses (Schilling et al, 2004). There is evidence that glycine may improve neurotransmission. When given glycine, CVA patients improved, as did the symptoms of apathy, and social withdrawal (Jellin et al, 2008).

Product Availability

Tablets

Dosages

- Adult PO tablets: 2-60 g daily in divided doses

Contraindications

Glycine should not be supplemented in those who are pregnant, breastfeeding, who have breast/prostate cancer or heart disease, or who are hypersensitive to this product. It should not be given to children.

Pharmacology

Pharmacokinetics

Glycine crossess the blood-brain barrier (Miyazato et al, 2005).

Client Considerations

Assess

- Assess the reason the client is using glycine.

Administer

- Keep glycine in a dry area, away from direct sunlight.

Teach Client/Family

- Teach the patient that glycine should not be used in children or supplemented in those who are pregnant or breastfeeding until more research is available.

Goat's Rue

(goets rew)

Scientific name: *Galega officinalis*

Other common names: French honeysuckle, French lilac, Italian fitch

Origin: Goat's rue is a perennial found in parts of Europe and Iran.

Uses

Goat's rue has been reported to function as both a diuretic and an antidiabetic. It is used to increase milk production.

Actions

Very little primary research is available for goat's rue, and no scientific studies confirm any of its reported actions. However, it has been used in Europe for many years to treat hyperglycemia. Toxicity may result from two of its chemical components, galegine and paragalegine. In one study (Palit et al, 1999) *Galega officinalis* shows a novel weight-reducing action that is independent of reduction of food intake in mice. Another study (Atanasov et al, 2000) identified the inhibiting and disaggregating effect of *Galega officinalis* on platelet aggregation. Liver and lung could serve as target organs in oral toxicity (Rasekh et al, 2008).

Product Availability

Dried leaves

Plant Parts Used: Dried leaves, flowers, stalks

Dosages

- Adult PO infusion: Pour 8 oz boiling water over 1 tsp dried leaves, let stand 15 min, strain, drink bid
- Adult PO tincture: 1-2 ml tid

Contraindications

Pregnancy category is 2; breastfeeding category is 2A.

Goat's rue should not be given to children. It should not be used by persons with hypersensitivity to it.

Side Effects/Adverse Reactions

CNS: Headache, restlessness, weakness

GI: Nausea

Interactions

Drug

Antidiabetics: Goat's rue may increase the effects of antidiabetics (theoretical).

Herb

Hypoglycemic herbs: Goat's rue used with other hypoglycemic herbs can lead to increased hypoglycemia (theoretical) (Jellin et al, 2008).

Lab Test

Blood glucose: Goat's rue may decrease blood glucose (theoretical) (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Components	Possible Action
Tannin		Wound healing
Alkaloid	Galegine	Possible toxicity
	Paragalegine; Peganine, Hydroxygalegine	Diuretic, hypoglycemic
Lectins		
Flavonoids		

Client Considerations

Assess

- Assess the reason the client is using goat's rue.
- Assess for hypersensitivity reactions. If these are present, discontinue use of glucosamine and administer an antihistamine or other appropriate therapy.
- Monitor blood glucose in the diabetic patients (see Interactions).

Administer

- Instruct the client to take this herb PO only after steeping for 15 minutes in boiling water and straining.

Teach Client/Family

- Inform the client that pregnancy category is 2 and breastfeeding category is 2A.
- Caution the client not to give goat's rue to children.

Golden Rod

(goeld-uhn-rahd)

Scientific name: *Solidago virgaurea*

Other common names: Aaron's rod, blue mountain tea, denrod, European gosweet goldenrod, woundwort

Origin: Golden rod is a flowering plant found in Europe and the United States.

Uses

Golden rod may be used as a diuretic, an antispasmodic, an analgesic, and an anti-inflammatory. In many countries, golden rod is used to prevent urolithiasis and to help eliminate calculi that have already been formed. Golden rod also may be used to induce abortion. It has been given to children to treat otitis media and for its anti-catarrh effect (Mills, Bone, 2000).

Actions

The primary actions of golden rod are diuretic, antispasmodic, antimicrobial, analgesic, and antiinflammatory (Melzig et al, 2004). However, little or no primary research is available to confirm most of its proposed actions and uses. One small study evaluated the ability of golden rod and several other herbs to reduce paw edema induced in laboratory rats. Golden rod has been found to reduce edema significantly. Another study identified the analgesic effects of several herbs, including golden rod. The analgesic effect is due to selective action to a single receptor (Sampson et al, 2000). Phytodor, a combination of aspen leaves/bark, common ash bark, and golden rod, is an alternative to NSAIDs or COX-2 inhibitors in painful inflammatory or degenerative rheumatic diseases (Gundermann et al, 2007).

Product Availability

Alcoholic extract, aqueous extract, dried herb

Plant Parts Used: Flowers, leaves

Dosages

- Adult PO decoction: 2 tsp chopped dried herb in 8 oz water, boil 15 min, let stand 2 min, strain, take 1 tbsp tid-qid

- Adult PO dried herb: 6-12 g daily (Blumenthal, 1998)
- Adult PO infusion of flowers and leaves: 2 tsp herb in 8 oz water, infuse 10-15 min, strain, drink all, take tid
- Adult PO tincture: 0.5-1 ml bid-tid (1:5 in 45% ethanol) (Jellin et al, 2008)

Contraindications

Pregnancy category is 3; breastfeeding category is 2A.
Golden rod should not be given to children. Without medical advice, golden rod should not be used by persons with congestive heart failure or renal disease. This herb should not be used by persons with hypersensitivity to it or other Asteraene family herbs.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions, rash
RESP: Asthma, difficult respirations
Toxicity: *Gastrointestinal hemorrhage, enlarged spleen, edema of abdomen, emaciation, tachypnea, severe vomiting, death*

Interactions

Drug

CNS depressants, diuretics: Golden rod may increase CNS depression, diuretics.
Lithium: Golden rod taken with lithium may result in dehydration and lithium toxicity; avoid concurrent use.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Phenolic glucoside	Lelocarposide; Isoschaftoside	
Dititerpene	Bisdesmoside	
Flavonoid	Rutin	Diuretic; antioxidant, increased urine volume; increased sodium excretion
	Hyperoside; Isoquercitrin	
Caffeoylguinic acids		
Saponin		Diuretic
Carotenoid		
Tannin		Wound healing; astringent
Nitrate		
Volatile oil	Gamma-cadinene	
Polysaccharide		

Client Considerations

Assess

- Assess the reason the client is using golden rod.
- Assess for hypersensitivity reactions, including asthma, rash, and difficult respirations. If such reactions are present, discontinue the use of golden rod and administer an antihistamine or other appropriate therapy.
- Assess for symptoms of toxicity: gastrointestinal hemorrhage, enlarged spleen, severe emesis, and tachypnea.

Administer

- Instruct the client to take golden rod PO after preparing a decoction.
- Instruct the client to store golden rod in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 2A.
- Caution the client not to give golden rod to children.
- Warn the client of the life-threatening side effects of golden rod.

Goldenseal

(goeld′uhn-seel)

Scientific name: *Hydrastis canadensis*

Other common names: Eye balm, eye root, goldsiegel, ground raspberry, Indian dye, Indian turmeric, jaundice root, orange root, turmeric root, yellow paint, yellow puccoon, yellow root, wild curcuma

Origin: Goldenseal is a perennial originally found in the Ohio River Valley and now cultivated.

Uses

Goldenseal is used to treat various conditions. Its most common uses include the treatment of gastritis, gastrointestinal ulceration, peptic ulcer disease, mouth ulcer, bladder infection, sore throat, and postpartum hemorrhage. It may also be used to treat skin disorders such as pruritus, boils, hemorrhoids, anal fissures, and eczema, as well as cancer and tuberculosis. Goldenseal may also be used to promote wound healing and reduce inflammation. It is used in combination with echinacea to treat cold and flu at onset.

Investigational Uses

Studies are underway to determine the efficacy of goldenseal in the treatment of cholera, *Giardia,* shigella, *Enterobacteriaceae,* and salmonella.

Actions

Goldenseal is used for its antiinfective, immunostimulant, antipyretic, and anticancer actions. Native Americans have used it for many years. Because it has been overused, this herb is now becoming endangered in the wild. Efforts are currently under way to cultivate goldenseal.

Antiinfective Action

One of the chemical components of goldenseal, berberine, has been shown to be effective against a number of bacteria, fungi, and protozoa. It is effective against *Staphylococcus* sp., *Streptococcus* sp., *Escherichia coli, Chlamydia* sp., *Salmonella typhi,*

Corynebacterium diphtheriae, Diplococcus pneumoniae, Pseudomonas sp., *Shigella dysenteriae, Entamoeba histolytica, Trichomonas vaginalis, Neisseria gonorrhoeae, Treponema pallidum, Giardia lamblia, Leishmania donovani,* and *Candida albicans.* Many other organisms have been shown to be sensitive to goldenseal in vitro.

Immunostimulant Action

Berberine increases the blood supply to the spleen, with possible immune stimulant effects (Sabir et al, 1971). Berberine has also been found to increase the action of macrophages.

Anticancer Action

Berberine has been shown to destroy brain tumor cells in rats at rates more double those of nitrosurea (Rong-Xun et al, 1990). An additive effect also accrues from combining berberine with nitrosurea.

Product Availability

Capsules, dried herb, fluid extract, powder, tablets, tea, tincture

Plant Part Used: Air-dried rhizome

Dosages

Dosages should be standardized to berberine content.

Bladder Infection

- Adult PO dried root/tea: 1-2 g tid (Murray, Pizzorno, 1998)
- Adult PO tincture: 4-6 ml (1-1½ tsp) tid (1:5 dilution) (Murray, Pizzorno, 1998)
- Adult PO fluid extract: 0.5-2 ml (¼-½ tsp) tid (Murray, Pizzorno, 1998)
- Adult PO freeze-dried root: 500-1000 mg tid (Murray, Pizzorno, 1998)
- Adult PO powdered solid extract: 250-500 mg tid (8% alkaloids) (Murray, Pizzorno, 1998)

Boils

- Adult PO topical poultice: 1 tbsp root powder mixed with water or egg white to make a paste, apply to area, cover with adsorbent material, use bid (Murray, Pizzorno, 1998)

General Use

- Adult PO infusion/tea: 2-4 g dried rhizome, drink in divided doses tid
- Adult PO fluid extract: 250 mg (1:1 dilution) tid
- Adult PO powder: 250-500 mg tid
- Adult PO tincture: 6-12 ml (1:5 dilution) tid
- Adult PO capsules: 500-600 mg qid
- Adult PO powdered root: ½-1 g divided into 3 daily doses (McCaleb et al, 2000)
- Adult PO tincture: 2-4 ml (1:10 dilution) (McCaleb et al, 2000)

Sore Throat

- Adult PO dried root/tea: 2-4 g tid (Murray, Pizzorno, 1998)
- Adult PO tincture: 6-12 ml (1½-3 tsp) (1:5 dilution) tid (Murray, Pizzorno, 1998)
- Adult PO fluid extract: 2-4 ml (½-1 tsp) (1:1 dilution) tid (Murray, Pizzorno, 1998)
- Adult PO powdered solid extract: 250-500 mg (8%-12% alkaloids) tid (Murray, Pizzorno, 1998)

Contraindications

Pregnancy category is 5; breastfeeding category is 4A.

Goldenseal should not be given to children. This herb should not be used by persons who have cardiovascular conditions such as heart block, arrhythmias, or hypertension, or by those who are hypersensitive to it. Goldenseal should not be used locally by persons with purulent ear discharge or by those with a ruptured eardrum.

Side Effects/Adverse Reactions

CNS: Hallucinations, delirium (prolonged use); *central nervous system depression, seizures; paralysis (increased doses), paresthesia*

CV: *Bradycardia, asystole, heart block*

EENT: Ocular phototoxicity (tinctures) (Chignell et al, 2007).

GI: Nausea, vomiting, anorexia, diarrhea, or constipation, abdominal cramping, mouth ulcers

INTEG: Hypersensitivity reactions, rash, contact dermatitis; phototoxicity (topical)

RESP: *Dyspnea (prolonged use)*

Toxicity: *Restlessness, nervousness, irritability, central nervous system depression, seizures, cardiovascular collapse, coma, death*

Interactions

Drug

Alcohol, antiarrhythmics, antihypertensives, beta-blockers, CNS depressants: Goldenseal may increase the effects of these products.

Antacids, H_2-blockers, proton pump inhibitors: Goldenseal may decrease these products (theoretical) (Jellin et al, 2008).

Anticoagulants, cardiac glycosides: Goldenseal may decrease the effects of these products.

Azole antifungals, benzodiazepines, calcium channel blockers: Goldenseal may slow the metabolism of these products.

Cytochrome P4503A4 substrates: Goldenseal may decrease the action of these agents (theoretical) (Gurley et al, 2008; Jellin et al, 2008).

Statins: Goldenseal may slow the metabolism of statins; avoid concurrent use.

Vitamin B: Goldenseal may decrease the absorption of vitamin B.

Lab Test

Bilirubin: Goldenseal may increase bilirubin levels (theoretical) (Jellin et al, 2008).

Blood osmolality, serum/urine plasma sodium: Goldenseal may increase blood osmolality and serum or urine plasma sodium.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Components	Possible Action
Alkaloid	Berberine	Immunostimulant, antibacterial, antisecretory, anticholinergic, antineoplastic

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Components	Possible Action
	Hydrastine Berberastine Canadine Candaline	Antibacterial
	Beta-hydrastine	Astringent, antibacterial
Resin **Phytosterin** **Chlorogenic acid**		

Client Considerations

Assess

- Assess the reason the client is using goldenseal.
- Assess for hypersensitivity reactions, including rash and contact dermatitis. If these are present, discontinue use of this herb and administer an antihistamine or other appropriate therapy.
- Assess the client's use of CNS depressants, beta-blockers, antihypertensives, antiarrhythmics, anticoagulants, cardiac glycosides, and antihypertensives. None of these drugs should be used concurrently with goldenseal (see Interactions).
- Assess for symptoms of toxicity (see Side Effects).

Administer

- Instruct the client to take goldenseal PO as an extract or as a dried rhizome.
- Instruct the client to store goldenseal products in a cool, dry place, away from heat and moisture.
- Advise the client to avoid the sun or wear protective clothing when using goldenseal topically (Inbaraj et al, 2001).

Teach Client/Family

- Inform the client that pregnancy category is 5 and breastfeeding category is 4A.
- Caution the client not to give goldenseal to children.
- Warn the client of the many life-threatening side effects of goldenseal.
- Advise the client not to perform hazardous activities such as driving or operating heavy machinery until physical response to the herb can be evaluated.

Gossypol

(gah'suh-pawl)

Scientific name: *Gossypium hirsutum*

Other common names: American upland cotton, common cotton, cotton, upland cotton, wild cotton

Origin: Gossypol is found in cotton and is made synthetically.

Uses

Gossypol is used as a male contraceptive, as a vaginal spermicide female contraceptive, to induce labor and delivery, and to treat dysmenorrhea. Gossypol is used for uterine fibroids, endometriosis, and dysfunctional uterine bleeding.

Actions

Male Contraception

The primary action of gossypol is contraceptive. Extensive testing began in China about 30 years ago. Studies have demonstrated the contraceptive effectiveness of this herb in both male and female laboratory animals. As a male contraceptive, gossypol decreases sperm production by inhibiting lactate dehydrogenase X, which is needed to produce sperm. Sperm recovered from rats and hamsters treated with gossypol were found to be immotile, with heads or tails not attached (Chang, 1980). No changes in libido or hormone levels occurred. The recommended dose for males is 20 mg per day until the sperm count is reduced to less than 4 million per ml (after about 90 days), then 75 to 100 mg given two times per month as a maintenance dose to keep the sperm count low. One study found gossypol to be more than 99% effective when used at the proposed levels (Wu, 1989). Sperm production usually returns to normal 90 days after termination of therapy. However, some men continue to experience lowered sperm production beyond 90 days.

Female Contraception

In female rats, gossypol has been shown to inhibit implantation and possibly to affect luteinizing hormone levels (Lin, 1985).

Product Availability

Extract

Plant Parts Used: Roots, seeds, stems

Dosages

Male Contraceptive

- Adult PO extract: 20 mg daily for 2-3 mo until sperm count drops to <4 million sperm/ml, then 75-100 mg every 2 wk for maintenance

Antineoplastic

- Adult PO extract: 10 mg bid or 0.6-0.8 mg/kg/day

Contraindications

Because it can induce labor, gossypol should not be used during pregnancy except under the direction of a qualified herbalist. Until more research is available, this herb should not be used during breastfeeding and should not be given to children. Persons with hypersensitivity to gossypol or those with hepatic/renal damage should not use it. Males may have a lowered sperm count for >90 days.

Side Effects/Adverse Reactions

CV: *Heart failure, circulatory collapse*
GI: Nausea, vomiting, anorexia, diarrhea
GU: Male sterility (prolonged use)
INTEG: Hypersensitivity reactions
MS: Muscle fatigue, weakness, *paralysis*

Interactions

Drug

Alcohol: Gossypol when given with alcohol leads to alcohol accumulation (Jellin et al, 2008).
Antifungals: Use of gossypol with antifungals may cause nephrotoxicity; do not use concurrently.
Cardiac glycosides *(digoxin):* Gossypol may increase the risk of cardiac glycoside toxicity (theoretical) (Jellin et al, 2008).
Diuretics *(bumetanide, ethacrynic acid, furosemide, hydrochlorothiazide, torsemide, triamterene):* Use of gossypol with diuretics may cause severe hypokalemia; do not use concurrently.
NSAIDs *(diclofenac, etodolac, fenoprofen, fluroprofen, indomethacin, ketoprofen, ketorolac, meclofenamate, nabumetone, naproxen, oxaprozin, piroxicam, sulindac, tolmetin):* Gossypol used with NSAIDs may result in gastrointestinal distress and gastrointestinal tissue damage.
Salicylates *(aspirin):* Gossypol used with salicylates may result in tissue damage.
Stimulant laxatives: Gossypol with stimulant laxatives may lead to hypokalemia (theoretical) (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Enantiomers		Contraceptive, anti-HIV

Client Considerations

Assess

- Assess the reason the client is using gossypol.
- Assess for hypersensitivity reactions. If present, discontinue use of gossypol and administer an antihistamine or other appropriate therapy.
- Assess for use of antifungals or diuretics, which should not be used concurrently with gossypol (see Interactions). Monitor potassium levels, which may be decreased with gossypol use.
- Assess for cardiovascular reactions, including arrhythmias.

Administer

- Instruct the client to take extract PO.
- Instruct the client to store gossypol products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use gossypol during pregnancy unless under the direction of a qualified herbalist, because it can induce labor.
- Caution the client not to use gossypol in children or those who are breastfeeding until more research is available.
- Warn the client of the life-threatening cardiovascular side effects of gossypol.

Gotu Kola

(goe-tew'koe-lah)

Scientific name: *Centella asiatica*

Other common names: Centella, hydrocotyle, Indian pennywort, Indian water navelwort, talepetrako, teca, water pennywort

Origin: Gotu kola is a creeping plant found in the swamps of Africa, Sri Lanka, and Madagascar.

Uses

Gotu kola is taken internally to treat hypertension, cancer, hepatic disorders, leprosy, and varicose veins; to increase fertility; and as a stimulant. It also may be taken internally to treat chronic interstitial cystitis, cellulite, and periodontal disease. Gotu kola may be used externally to promote wound healing and to treat skin disorders such as psoriasis, eczema, and keloids.

Investigational Uses

New studies are underway for the use of gotu kola to prevent gastric ulcers.

Actions

Wound Healing Action

Gotu kola is used primarily as a topical preparation to promote wound healing. In one study using laboratory rats, gotu kola penetrated tissues in high concentrations and produced a faster rate of healing with topical administration than with oral. Increased collagen was found in the cell layer in the form of fibronectin (Tenni et al, 1988). One of the chemical components of gotu kola, the glycoside madecassoside, decreases inflammation while another glycoside, asiaticoside, may be responsible for wound healing.

Antiinfertility Action

In a preliminary study, gotu kola was shown to decrease infertility in female mice. The mechanism of action is unknown (Dutta et al, 1968).

Other Actions

Other possible uses of gotu kola that have not been investigated to any great degree include its antihypertensive, anticancer, periodontal disease, cellulite, and connective tissue regulation actions. One study has confirmed the gastroprotective effects of *Centella asiatica.* Rats were induced with gastric lesions by ethanol; the oral administration of *Centella* extract significantly inhibited gastric lesions (Cheng et al, 2000). Another study (Flora et al, 2007) found a beneficial effect against arsenic-induced oxidative stress but possessed no chelating properties. Positive cognition and mood was the result after administration of gotu kola in healthy elderly people (Wattanathom et al, 2008).

Product Availability

Capsules, cream, dried herb, extract

Plant Part Used: Dried leaves

Dosages

No topical dosages are available.

Cellulite

- Adult PO extract: 30 mg triterpenes tid (Murray, Pizzorno, 1998)

General Use
- Adult PO capsule: 450 mg daily
- Adult PO dried leaf: 0.3-0.6 g tid

Periodontal Disease
- Adult PO extract: 30 mg triterpenes bid (Murray, Pizzorno, 1998)

Varicose Veins
- Adult PO extract: 30-60 mg triterpenes daily (Murray, Pizzorno, 1998)

Contraindications
Pregnancy category is 2; breastfeeding category is 2A.
Gotu kola should not be given to children. It should not be used by persons with hypersensitivity to this herb or to members of the celery family.

Side Effects/Adverse Reactions
CNS: Sedation
GI: *Possible hepatotoxicity* (Jorge et al, 2005).
INTEG: Hypersensitivity reactions such as burning (topical use), contact dermatitis, rash, pruritus
SYST: Increased blood glucose, increased cholesterol levels

Interactions
Drug
Antidiabetics, antilipidemics: Gotu kola may decrease the effectiveness of antidiabetics, antilipidemics; do not use concurrently.
CNS depressants: Gotu kola with CNS depressants results in increased sedation (theoretical) (Jellin et al, 2008).
Herb
Sedative herbs: Gotu kola with sedating herbs leads to increased sedation (theoretical) (Jellin et al, 2008).
Lab Test
Glucose, cholesterol: Gotu kola may increase these levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Glycoside	Madecassoside; Madecasoside	Antiinflammatory
	Asiaticoside	Wound healing
	Brahmoside; Brahminoside	Sedative
	Centelloside	
Madecassol Acid	Madecassic acid; Centellic acid; Centoic acid; Asiatic acid; Asiaticentoic acid	
Tannin		Wound healing
Phytosterol		
Flavonoid	Kaempferol; Quercetin	Antiinflammatory

Adverse effects: *Underline* = life-threatening

Client Considerations

Assess

- Assess the reason the client is using gotu kola.
- Assess for hypersensitivity reactions: burning (topical), contact dermatitis, rash, and pruritus. If these are present, discontinue the use of this herb and administer an antihistamine or other appropriate therapy.
- Assess for medications used (see Interactions).

Administer

- Instruct the client to store gotu kola products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 2 and breastfeeding category is 2A.
- Caution the client not to use gotu kola in children.
- Explain to the client that gotu kola is not the same as other cola species.

Grapeseed

(grayp'seed)

Scientific name: *Vitis vinifera*

Other common name: Muskat

Origin: Grapeseed is found throughout the world.

Uses

Grapeseed may be used as an antioxidant and an anticancer treatment. It may also be used to treat varicose veins, circulatory problems, and vision problems such as cataracts, and to improve vision by lessening eye strain.

Investigational Uses

Researchers are experimenting with the use of grapeseed to treat diabetes mellitus and inflammatory, degenerative, diverticular, and heart diseases.

Actions

Vision Improvement

Grapeseed has produced beneficial effects in people with vision problems. One study focused on participants with computer-related visual stress. People who worked at a video display terminal (VDT) for at least 6 hours a day were assigned to one of three groups, receiving either grapeseed, bilberry, or a placebo. After 2 months, the grapeseed group reported much less visual stress, with improvements even greater than those seen in the bilberry group (Fusi et al, 1990). An earlier study had shown grapeseed to be significantly more effective than a placebo in improving night vision. This earlier study included 98 people who experienced prolonged nighttime visual glare or visual stress caused by VDTs (Corbe et al, 1988).

Other Actions

Grapeseed has shown protective effects against carbon tetrachloride hepatic poisoning in mice (Oshima et al, 1995), as well as photoprotective properties of melanins (Novikov et al, 2001). A significant antioxidant, grapeseed is stronger than the antioxidant properties of vitamin C or E for the skin (Comacchione et al, 2007).

Product Availability

Capsules, tablets, drops, liquid concentrate, cream

Plant Part Used: Seeds

Dosages

Dosages are standardized to 85%-95% procyanidins.

Supplementation

- Adult PO capsules/tablets: 50-100 daily (McCaleb et al, 2000)

Therapeutic Use

- Adult PO capsules/tablets: 150-300 mg daily for 21 days, then 50-80 mg daily maintenance (McCaleb et al, 2000)

G

Contraindications

Until more research is available, grapeseed should not be used during pregnancy and breastfeeding. It should not be given to children.

Side Effects/Adverse Reactions

CNS: Dizziness
GI: Nausea, anorexia, *hepatotoxicity (theoretical)*
INTEG: Rash

Interactions

Drug

Anticoagulants, antiplatelets: Grapeseed given with these agents may increase the risk of bleeding (theoretical) (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Flavonoid	Kaempferol; Quercetin	Antiinflammatory, antioxidant
Tannin	Proanthocyanidins	Wound healing, antioxidant
Tocopherol		
Fatty acid		

Client Considerations

Assess

- Assess the reason the client is using grapeseed.
- If the client is using grapeseed to improve cardiovascular disorders, assess cardiovascular status: edema in legs, improvement in atherosclerosis, and improvement in varicose veins. Monitor blood pressure and pulse.
- Identify other cardiovascular medications taken by the client.
- Assess for hepatotoxicity.

Administer

- Instruct the client to take grapeseed PO only once per day.
- Instruct the client to store grapeseed products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use grapeseed in children or those who are pregnant or breastfeeding until more research is available.

Graviola

(grav′ ee-oh′luh)

Scientific name: *Annona muricata, Annon cherimola*

Other common names: Braxilian cherimoya, Brazilian paw paw, corossolier, corossol epineux, sour sop, toge-banreist

Origin: Graviola comes from Brazil.

Uses

Traditionally, graviola is used for its antibiotic, sedative, emetic, and cathartic properties.

Actions

There is little research for graviola's use in any condition. There is beginning evidence that graviola may be useful in cancer therapy. It is believed that acetogenins, a chemical component, may block the production of ATP (Jellin et al, 2008). Atypical parkinsonism has been linked to the consumption of fruit and infusions or decoctions prepared from the leaves (Champy et al, 2005).

Product Availability

No commercial products

Plant Parts Used: Fruit, seeds, leaves, bark

Dosages

No published doses

Contraindications

Graviola should not be used in children or those who are pregnant, breastfeeding, hypersensitive to this herb, or who have Parkinson's disease.

Side Effects/Adverse Reactions

CNS: Parkinson's-like symptoms

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Acetogenins		Anticancer
Isoquinolones		Neurotoxic

= Pregnancy = Pediatric = Alert = Popular Herb

Client Considerations

Assess

- Assess the reason the client is using graviola.

Administer

- Keep graviola in a dry area, away from direct sunlight.

Teach Client/Family

- Caution the client not to use graviola in children, those who are pregnant or breast-feeding, or those who have Parkinson's disease until more research is available.
- Advise the patient to report any movement disorders.

Green Tea

(green tee)

Scientific name: *Camellia sinensis*

Other common name: Matsu-cha

Origin: Green tea is a shrub found in Asia.

Uses

Green tea is used as a general antioxidant, anticancer agent, diuretic, stimulant, antibacterial, antilipidemic, and antiatherosclerotic.

Investigational Uses

Research is underway to confirm the use of green tea in treating HIV, increasing muscle health, reducing total cholesterol, and vascular protection. Green tea is shown to be effective in reducing the risk of bladder, ovarian, esophageal, gastric, and pancreatic cancer. Green tea may reduce the risk of breast cancer reoccurring (Jellin et al, 2008). It increases cognitive function and delays Parkinson's disease.

Actions

Green tea and black tea come from the same plant, *Camellia sinensis.* Black tea is produced by allowing the leaves to oxidize, while green tea is cut and steamed. The major actions of green tea result from its antioxidant, anticancer, and antilipidemic properties.

Antioxidant and Anticancer Actions

Green tea exerts protective effects against gastrointestinal cancers of the stomach, intestine, colon, rectum, and pancreas. One study showed a significant reduction in these cancers when green tea was used (Ji et al, 1997). Green tea also has been shown to decrease the incidence of breast cancer in vitro by inhibiting the interaction with estrogen receptors (Komori et al, 1993). In one study laboratory-induced lung cancer in rats was shown to be decreased in those that received a 2% solution of green tea. The cancer rates for the green tea group were 16%, as compared with 46% in the group that drank only water (Luo et al, 1995). In many studies, black tea has been shown to increase cancer risk in the endometrium and gallbladder. The chemical component epigallocatechin gallate from green tea was able to strongly inhibit the replication of two strains of HIV when tested on blood lymphocytes (Fassina et al, 2002).

Antilipidemic Action

In one study, green tea produced a significant increase in HDL and a decrease in LDL lipoproteins. These reactions occurred in direct proportion to the amount of green tea consumed (Imai et al, 1995).

Other Actions

Green tea was able to improve muscle health by reducing or delaying necrosis in mice by an antioxidant mechanism (Buetler et al, 2002). Another action being studied is the consumption of green tea to reduce lipids and lipoproteins (Tokunaga et al, 2002). Green tea can prevent cold and flu symptoms and enhance gamma, delta T cell function (Rowe et al, 2007).

Product Availability

Tablets, capsules, dried/liquid extract, tea

Plant Part Used: Dried leaves

Dosages

Green tea is standardized to 60% polyphenols.

- Adult PO extract: 250-400 mg/day of standardized to 90% polyphenols (McCaleb et al, 2000)
- Adult PO tea: 1 tsp tea leaves in 8 oz hot water, drink 2-5 cups/day (McCaleb et al, 2000)

Contraindications

Green tea should not be used by persons with hypersensitivity to this product or by those with kidney inflammation, gastrointestinal ulcers, insomnia, cardiovascular disease, or increased intraocular pressure. This herb contains caffeine. Decaffeinated tea is available, although some caffeine may remain.

Side Effects/Adverse Reactions

CNS: Anxiety, nervousness, insomnia (high doses)
CV: Increased blood pressure, palpitations, irregular heartbeat (high doses)
GI: Nausea, heartburn, increased stomach acid (high doses)
INTEG: Hypersensitivity reactions

Interactions

Drug

Antacids: Antacids may decrease the therapeutic effects of green tea (theoretical).
Anticoagulants, antiplatelets: Green tea with anticoagulants, antiplatelets may increase risk of bleeding (theoretical) (Jellin et al, 2008).
Beta-adrenergic blockers: Green tea used with these agents can lead to increased inotropic effects.
Benzodiazepines: Green tea with these agents increases sedation (theoretical) (Jellin et al, 2008).
Bronchodilators, xanthines *(theophylline)*: Large amounts of green tea increase the action of xanthines, some bronchodilators.
MAOIs *(isocarboxazid, phenelzine, tranylcypromine):* Green tea used in large amounts taken with MAOIs can lead to hypertensive crisis, do not use together.

Interactions—cont'd

Herb

Ephedra: Concurrent use of ephedra and caffeinated green tea may increase hypertension and CNS stimulation; avoid concurrent use with caffeinated green tea products.

Food

Dairy products: Dairy products may decrease the therapeutic effects of green tea.

Iron: Green tea may decrease iron absorption.

Lab Test

Glucose, VMA, urine creatine, urine catecholamine: Green tea may increase these levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Tannin		Wound healing; antiinflammatory
Flavonoid	Epigallocatechin gallate Catechin Epicatechin; Epicatechin gallate; Proanthocyanidins	Antioxidant; anti-HIV Chemoprotective
Xanthines	Caffeine; Theobromine; Theophylline	Central nervous system stimulant
Lignin		
Organic acid		
Protein		
Vitamin	C	Lipolytic

Client Considerations

Assess

- Assess the reason the client is using green tea.
- Assess for hypersensitivity reactions. If present, discontinue the use of this herb and administer an antihistamine or other appropriate therapy.
- Assess for other conditions that are contraindications to green tea use, including cardiovascular and renal disease, and increased intraocular pressure.
- Assess for use of antacids, dairy products, and ephedra (see Interactions).

Administer

- Instruct the client to store green tea in a cool, dry place, protected from heat and moisture.

Teach Client/Family

- Caution the client with renal or cardiovascular disease, or increased intraocular pressure not to use green tea products that contain caffeine.
- Teach the client not to use green tea with antacids or milk because its effect is decreased.

Ground Ivy

Scientific name: *Glechoma hederacea*

Other common names: Alehoof, cat's foot, creeping Charlie, haymaids, hedgemaids

Origin: Ground ivy is a flowering plant found in the United Kingdom.

Uses

Many herbalists recommend ground ivy to treat sinusitis, allergic conditions, bronchitis, and various conditions of the ears, nose, and throat. It may also be used to treat disorders of the gastrointestinal system such as diarrhea.

Actions

Very little information is available on ground ivy other than anecdotal evidence. Although this herb is reported to clear sinusitis, rhinitis, and upper respiratory congestion, one study identified the antiinflammatory process by controlling macrophage-mediated inflammatory-related diseases (An et al, 2006).

Product Availability

Fluid extract, infusion, tincture, tea

Plant Parts Used: Flowers, leaves

Dosages

- Adult PO fluid extract: 14-28 grains tid
- Adult topical: crushed leaves are applied to area
- Child >6 yr: to prevent toxicity use a very low dose, only under the supervision of an herbalist

Contraindications

Until more research is available, ground ivy should not be used during pregnancy and breastfeeding. It should not be given to children younger than 6 years of age. Ground ivy should not be used by persons with hypersensitivity to it.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions
Toxicity: *Diaphoresis, bronchial congestion and edema, cyanosis, pupil dilatation*

Interactions

Drug

Iron salts: Ground ivy may decrease the absorption of iron salts; avoid concurrent use.

Herb

Pennyroyal: Ground ivy with pennyroyal increases hepatotoxicity (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Flavonoid		
Volatile oil	Pulegone	Abortifacient, hepatotoxic, irritant
Tannin		Wound healing
Saponin		
Glycosides	Apigenin, Luteolin, Glucopyranoside, Cistanoside Icariol (Yamauchi et al, 2007)	
Resin		
Sesquiterpene		
Bitter	Glechomine	

Client Considerations

Assess

- Assess the reason the client is using ground ivy.
- Assess for hypersensitivity reactions. If present, discontinue the use of this herb and administer an antihistamine or other appropriate therapy.
- Assess for toxicity (see Side Effects).

Administer

- Instruct the client to store ground ivy in a cool, dry place, away from heat or moisture.

Teach Client/Family

- Caution the client not to use ground ivy in those who are pregnant or breastfeeding until more research is available.
- Caution the client not to give ground ivy to children younger than 6 years of age. With older children, ground ivy should be used only in very small amounts under the supervision of an herbalist.
- Advise the client that toxicity has occurred in animals.

Guarana

(gwah'rah-nuh)

Scientific names: *Paullinia cupana, Paullinia sorbilis*

Other common names: Brazilian cocoa, guarana gum, guarana paste, zoom

Origin: Guarana is a paste made from seeds of a shrub found in the Amazon and Brazil.

Uses

Guarana traditionally has been used as a stimulant and is typically used in combination with other products to promote weight loss.

Actions

Very few studies corroborate any of the uses or actions of guarana in humans.

Antioxidant Action

One study examined the antioxidant effects of guarana (Mattei et al, 1998). The herb was found to possess antioxidant components.

Stimulant/Weight Loss Action

Guarana has been used for centuries in Brazil for its stimulant properties, which result from its high caffeine content. Weight loss occurs when ephedra is combined with caffeine products. Because guarana has a significant caffeine content, weight loss may be expected when it is combined with ephedra. However, central nervous system stimulation may be increased significantly when the two are combined. Delayed gastric emptying and promotion of fullness may be responsible for the weight reduction effect of guarana (Andersen et al, 2001).

Antineoplastic Action

There may be chemoprotective effects of guarana, as identified in one study (Fukumasu et al, 2006). In the laboratory, mice were used to identify the reduction in macroscopic lesions. In another study (Fukumasu et al, 2008), guarana treatment decreased proliferation and increased apoptosis of tumor cells.

Other Actions

The lyophilized extract of guarana seeds identified an antidepressant effect after long-term use in rats (Otobone et al, 2007).

Product Availability

Capsules, elixir, extract, tablets, tea; component in various supplements, drinks, flavorings, weight-loss products, and gum

Plant Part Used: Seeds

Dosages

Dosages vary widely depending on the form used.

- Adult PO: do not exceed 3 g/day

Contraindications

Class 2d herb (*P. cupana* seed).

Because of its caffeine content, and until more research is available, guarana should not be used during pregnancy (caffeine crosses placenta) and breastfeeding (caffeine enters breast milk). Guarana should not be given to children. It should not be used by persons with cardiovascular diseases such as hypertension, arrhythmias, or heart block, or by persons with duodenal ulcers, diabetes, renal disease, or hypersensitivity to this product.

Side Effects/Adverse Reactions

CNS: Headache, anxiety, nervousness, restlessness, insomnia, tremors, *seizures*
CV: Hypertension, palpitations, *tachycardia, arrhythmias*
GI: Nausea, vomiting, anorexia, diarrhea
INTEG: Hypersensitivity reactions

Interactions

Drug

Adenosine: Guarana may decrease the adenosine response.
Antihypertensives: Guarana may decrease the effects of antihypertensives (theoretical).
Beta-blockers: Guarana may increase the effects of beta-blockers such as metoprolol (theoretical).
Bronchodilators: Guarana may increase the action of bronchodilators due to caffeine content.
MAOIs *(isocarboxazid, phenelzine, tranylcypromine):* Guarana in large amounts taken with MAOIs can result in hypertensive crisis; do not use together.
Xanthines: Xanthines such as theophylline and caffeine may increase pulse rate, blood pressure, and arrhythmias when used with guarana; avoid concurrent use.

Herb

Black tea, green tea, yerba maté: Guarana may increase the action of these products.
Ephedra: Concurrent use of ephedra and guarana may increase hypertension and CNS stimulation; avoid concurrent use.

Food

Caffeinated drinks: Guarana may increase the caffeine action.

Lab Test

Urate, bleeding time: Guarana may increase these levels.
Pheochromocytoma/neuroblastoma test: Guarana may cause a false positive result.

Pharmacology

Pharmacokinetics

Caffeine crosses the placenta and enters breast milk. Other pharmacokinetics and pharmacodynamics are unknown.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Tannin	Catechutannic acid	Wound healing
	Tannic acid; Catechol; Catechin	Antioxidant
Saponin	Timbonine	Skin softener
Xanthine	Caffeine	Central nervous system stimulator
	Theophylline	
	Theobromine	

Client Considerations

Assess

- Assess the reason the client is using guarana.
- Assess for hypersensitivity reactions. If present, discontinue the use of this herb and administer an antihistamine or other appropriate therapy.
- Assess for use of medications and herbs (see Interactions).

Administer

- Instruct the client to store guarana products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Because of the caffeine content, caution the client not to use guarana in children or those who are pregnant or breastfeeding until more research is available.
- Warn the client of the life-threatening side effects of guarana.
- Advise client that insomnia may occur; take at least 6 hr before bedtime.

Guar Gum

(gwahr guhm)

Scientific name: *Cyamopsis tetragonolobus*

Other common names: Guar flour, gucran, Indian cluster bean, jaguar gum

Origin: Guar gum is an annual found in India, the United States, and the tropics of Asia.

Uses

Guar gum has been used to treat hyperlipidemia, diabetes mellitus, and obesity.

Actions

The primary actions of guar gum are bulk laxative, antihyperlipidemic, and antidiabetes.

Antihyperlipidemic Action

Guar gum has been shown to decrease cholesterol and LDL levels with little or no effect on triglyceride HDL levels. Its cholesterol-lowering effect may be due to increased bile excretion of cholesterol. This action mirrors that of bile sequestering drugs. Guar gum used in combination with other antihyperlipidemics lowers cholesterol to a much greater extent than either used alone (Uusitupa, 1992).

Antidiabetes Action

The antidiabetes action of guar gum may result from the increased transit of gastrointestinal tract contents through the gastrointestinal system or from adsorbing glucose in the gut. Studies have shown guar gum to decrease blood glucose (Landin et al, 1992).

Weight Reduction

One study (Pittler et al, 2001) showed that guar gum is not useful for weight loss primarily because of the adverse reactions of abdominal pain, flatulence, diarrhea, and cramps.

Product Availability

Flour

Plant Part Used: Endosperm

Dosages

No published dosages are available.

Contraindications

Class 2d herb (seed).

Until more research is available, guar gum should not be used during pregnancy and breastfeeding. It should not be given to children. Guar gum should not be used by persons with hypersensitivity to this product. Persons with bowel obstruction or dehydration should not use guar gum; these conditions will worsen. Caution should be exercised in persons with swallowing difficulty.

Side Effects/Adverse Reactions

GI: Flatulence, nausea, vomiting, anorexia, *gastrointestinal obstruction*

INTEG: Hypersensitivity reactions

Interactions

Drug

All oral medications: Guar gum may decrease the absorption and action of all oral medications.

Insulin: Guar gum may delay glucose absorption when used with insulin; insulin dose may need to be decreased.

Food

Nutrients: Guar gum can lead to decreased nutrient absorption.

Lab Test

Blood cholesterol, blood glucose: Guar gum may decrease blood cholesterol and blood glucose levels.

Pharmacology

Pharmacokinetics

Pharmacokinetics and pharmacodynamics are unknown. Guar gum is not absorbed.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Polysaccharide	Galactomannan	Antidiabetes; antihyperlipidemic

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of guar gum and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store guar gum products in a cool, dry place, away from heat and moisture.
- Assess for medications used (see Interactions).

Teach Client/Family

- Caution the client not to use guar gum in children or those who are pregnant or breastfeeding until more research is available.
- Caution the client not to use guar gum with bowel obstruction or dehydration. These conditions will worsen.
- Instruct the client to take guar gum with adequate fluids to prevent bowel obstruction, dehydration.
- Inform the client that caution should be taken in those with swallowing difficulties.

Guggul

(gew'guhl)

Scientific name: *Commiphora mukul*

Other common names: Mukul myrrh tree, myrrh

Origin: Guggul is found in India.

Uses

Guggul is used to decrease high cholesterol, to promote weight loss, and to treat arthritic conditions. It is used in Ayurvedic medicine to treat obesity and increase fat metabolism. Guggul is believed to increase thyroid function, but no studies confirm this. Guggul may be used to treat gum infections (gingivitis, pyorrhea, mouth ulcers) and for sore throat and digestive complaints.

Actions

Anticholesterol Action

Guggulsterones have been shown to decrease cholesterol synthesis in the hepatic system and promote the breakdown and excretion of cholesterol (Satyavati, 1991; Urizar et al, 2002; Wu et al, 2002). Three studies have investigated the use of guggul for the reduction of cholesterol and triglyceride levels, and all showed a significant reduction of both (Nityanand et al, 1989; Verma et al, 1988; Agarwal et al, 1986). Two of the studies used guggulipid, and the third used gum guggul.

Antiobesity Action

More studies are needed to confirm the efficacy of guggul in reducing obesity and stimulating thyroid function. To date, no studies have confirmed these potential actions.

Other Actions

The terpenoids and guggulsterones possess antiinflammatory actions (Francis et al, 2004). The guggulsterone Z possesses anti–prostate cancer actions (Xiao et al, 2008).

Product Availability

Alcoholic extract, crude gum, gugulipid, guggulsterone, petroleum ether extract

Plant Part Used: Resin

Dosages

- Adult PO alcoholic extract: 4.5 g daily
- Adult PO crude gum guggul: 10 g daily
- Adult PO gugulipid: 500 mg, standardized to 5% guggulsterones
- Adult PO guggulsterone: 25 mg tid
- Adult PO petroleum ether extract: 1.5 g daily

Contraindications

Pregnancy category is 5; breastfeeding category is 4A.
Guggul should not be given to children. Persons with hypersensitivity to guggul should not use it.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, diarrhea
GU: Kidney irritation (large doses)
INTEG: Hypersensitivity reactions, rash
MS: *Rhabdomyolysis* (Bianchi et al, 2004)

Interactions

Drug

Anticoagulants, antiplatelets: Guggul may increase risk for bleeding when used with these agents.
Diltiazem, propranolol: Guggul can lead to reduced action by these agents.
Thyroid hormones: Guggul may alter the action of thyroid hormones.

Herb

Garlic: Guggul may increase the antilipid action.

Lab Test

Cholesterol, LDL, triglycerides: Guggul may lower these levels.
Thyroid stimulating hormone: Guggul decreases thyroid stimulating hormone.
T_3: Guggul increases T_3.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Components	Possible Action
Guggulsterones	E; Z	Lipid lowering; bile acid antagonist, thyroid stimulation; antiinflammatory (Francis et al, 2004); anticancer (Xiao et al, 2008)
Aromatic acid		
Nonaromatic acid		
Steroidal compound		
Terpenoids		COX-2 inhibitor

Client Considerations

Assess

- Assess the reason the client is using guggul.
- Assess for hypersensitivity reactions. If present, discontinue the use of guggul and administer an antihistamine or other appropriate therapy.
- Assess liver function tests, thyroid panel.

Administer

- Instruct the client to take guggul PO.
- Instruct the client to store guggul products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 5 and breastfeeding category is 4A.
- Caution the client not to give guggul to children until more research is available.

Gymnema

Scientific name: *Gymnema sylvestre*

Other common names: Gurmar, meshashringi, merasingi

Origin: Gymnema is found in India and Africa.

Uses

Gymnema has been used traditionally in Ayurvedic medicine as a laxative, and to treat diabetes mellitus and malaria.

Investigational Uses

Studies are underway for the use of gymnema to lower lipids.

Actions

Antidiabetes Action

The antidiabetes action of this herb may be due to its ability to stimulate functioning beta cells in the pancreas to release insulin. A review of the literature identified gymnema as an alternative for diabetes mellitus treatment (Leach, 2007).

Lipid-Lowering Action

A few studies have shown the lipid-lowering effect of *Gymnema* (Shigematsu et al, 2001a; Shigematsu, 2001b).

Product Availability

Extract

Plant Part Used: Leaves

Dosages

Diabetes Mellitus

- Adult PO extract: 200 mg bid (Murray, Pizzorno, 1998), 400 mg bid (Jellin et al, 2008)

Contraindications

Pregnancy category is 3; breastfeeding category is 1A.
Gymnema may be given to children. Persons with hypersensitivity to gymnema should not use it.

Side Effects/Adverse Reactions

ENDO: Hypoglycemia
GI: Nausea, vomiting, anorexia, inhibition of bitter/sweet taste
INTEG: Hypersensitivity reactions

Interactions

Drug

Antidiabetics *(acetohexamide, chlorpropamide, glipizide, glyburide, metformin, tolazamide, tolbutamide, troglitazone),* ***insulin:*** Gymnema may increase the action of antidiabetics, insulin (theoretical).

Lab Test

Blood glucose, LDL, total cholesterol: Gymnema may cause decreased blood glucose (decoctions, infusions), LDL cholesterol, and total cholesterol.

G

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Gymnemic acid Triterpene glycosides	Longispinogenin	Antidiabetes

Client Considerations

Assess

- Assess the reason the client is using gymnema.
- Assess for hypersensitivity reactions. If present, discontinue the use of gymnema and administer an antihistamine or other appropriate therapy.
- Assess for use of insulin and antidiabetics (see Interactions).

Administer

- Instruct the client to store gymnema in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 1A.
- Inform the client that gymnema may be given to children.

Hawthorn

(haw′thawrn)

Scientific name: *Crataegus* spp.

Other common names: Li 132, may, maybush, quickset, thorn-apple tree, whitethorn

Origin: Hawthorn is a bush or tree found throughout the United States, Canada, Europe, and Asia.

Uses

Hawthorn is one of the most commonly used herbs. It is used to treat cardiovascular disorders such as hypertension, arrhythmias, arteriosclerosis, congestive heart failure, Buerger's disease, and stable angina pectoris.

Actions

Cardiovascular Action

Hawthorn exerts both antihypertensive and antihyperlipidemic effects. It increases blood supply to the heart, increases the force of contractions, and indirectly inhibits angiotensin-converting enzyme (ACE). The proanthocyanidins, among the chemical components of hawthorn, have been shown to inhibit ACE in a manner similar to that of the drug captopril. Hawthorn also stabilizes collagen, reduces atherosclerosis, and decreases cholesterol. The collagen-stabilizing action of hawthorn helps to keep the artery strong and free of plaque development. Hawthorn can be used with cardiac glycosides in the treatment of congestive heart failure. In one study, participants received 600 mg of standardized hawthorn extract or a placebo daily. The treatment group experienced increased cardiac working capacity and reduced blood pressure (Schmidt et al, 1994, 2000). Hawthorn has been shown to reduce hypertension in laboratory animals (Koçyildiz et al, 2006).

Other Actions

The hawthorn extract is a scavenger, increases intracellular GSH levels, and is not cytotoxic. Therefore, it is considered an adequate antioxidant (Ljubuncic et al, 2005).

Product Availability

Capsules of berries, extended release capsules, fluid extract, leaves, solid extract, tea, tincture, topical cream

Plant Parts Used: Flowers, fruit, leaves

Dosages

Angina

- Adult PO berries of flowers, dried: 3-5 g tid or as a tea (Murray, Pizzorno, 1998)
- Adult PO fluid extract: 1-2 ml (¼-½ tsp) tid (1:1 dilution) (Murray, Pizzorno, 1998)
- Adult PO solid extract: 100-250 mg tid (10% procyanidin or 1.8% vitexin-4′-rhamnoside) (Murray, Pizzorno, 1998)
- Adult PO tincture: 4-6 ml (1-1½ tsp) tid (1:5 dilution) (Murray, Pizzorno, 1998)

Coronary Artery Disease

- Adult PO solid extract: 100-250 mg tid (10% procyanidin content or 1.8% vitexin-4′-rhamnoside) (Murray, Pizzorno, 1998)

General Use

- Adult PO solid extract: 120-240 mg tid of a standardized product (18.75% procyanidines or 2.2% flavonoids)
- Adult PO tea: 1-2 tsp berries, steep in 8 oz water for 15 min, strain, drink tid
- Adult PO tincture: 5 ml tid (1:5 dilution)

Moderate Hypertension

- Adult PO solid extract: 100-250 mg tid (10% procyanidin content or 1.8% vitexin-4′-rhamnoside) (Murray, Pizzorno, 1998)

General Use

- Child PO tea: 1 cup several times/wk (Romm, 2000)
- Child PO tincture: ¼-1 tsp up to tid (Romm, 2000)
- Child topical cream: apply prn (Romm, 2000)

Contraindications

Pregnancy category is 2; breastfeeding category is 2A.
Hawthorn may be given to children. It should not be used by persons with hypersensitivity to this herb or *Rosaceae* spp.

Side Effects/Adverse Reactions

CNS: Fatigue, sedation
CV: Hypotension, *arrhythmias*
GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions

Interactions

Drug

Antihypertensives (beta-blockers): Hawthorn may increase hypotension when used with antihypertensives; avoid concurrent use.
Cardiac glycosides: Hawthorn may increase the effects of cardiac glycosides; monitor concurrent use carefully.
CNS depressants: Hawthorn may increase the sedative effects of CNS depressants such as alcohol, barbiturates, and psychotropics; avoid concurrent use.
Iron salts: Hawthorn tea may decrease the absorption of iron salts; separate by at least 2 hours.

Herb

Adonis, lily of the valley, squill: Hawthorn increases the action of *Adonis vernalis, Convallaria majalis, Scillae bulbus* when taken concurrently.
Fenugreek, ginger: Hawthorn may increase cardiac events when used with these products.

Lab Test

Serum digoxin: Hawthorn may cause false increase of serum digoxin.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Components	Possible Action
Flavonoid	Quercetin Rutin Hyperoside; Vitexin; Vitexin-rhamnoside	Antiinflammatory Antioxidant
Proanthocyanidin	Procyanidin C-1	Angiotensin-converting enzyme (ACE) inhibitor; chronotropic Antiviral
Catechin **Epicatechin** **Eudesmanolide**		

Client Considerations

Assess

- Assess the reason the client is using hawthorn.
- Assess for hypersensitivity reactions. If present, discontinue the use of hawthorn and administer an antihistamine or other appropriate therapy.
- Assess cardiovascular status if the client is taking hawthorn to treat congestive heart failure.
- Assess for other cardiovascular drugs the client may be taking, including beta-blockers, cardiac glycosides, central nervous system depressants, and antihypertensives; assess for use of the herbs (see Interactions).

Administer

- Instruct the client to take hawthorn PO as an extract, tincture, or tea.
- Instruct the client to store hawthorn products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 2 and breastfeeding category is 2A.
- Inform the client that hawthorn may be given to children.
- Caution the client to check with the prescriber before giving hawthorn to a child who is taking cardiovascular medications (Romm, 2000).
- Advise the client not to use this herb if allergic to *Rosaceae* spp.

Hops

(hahps)

Scientific name: *Humulus lupulus*

Origin: The hop plant is a perennial that is cultivated throughout the world.

Uses

Hops traditionally have been used as an analgesic, an anthelmintic, a sedative/hypnotic to treat insomnia, and for attention deficit–hyperactivity disorder. It is also used to treat menopausal symptoms and to wean patients off conventional sedative prescriptions.

Actions

Hops have been used by the food and liquor industries as a flavoring for food and beer. Medicinal uses for hops are described here, although little reliable research exists for any uses or actions.

Estrogenic Action

Hops are believed to possess estrogen-like activity due to the phytoestrogen components of the hop plant and its ability to exert direct estrogenic effects (Zava et al, 1998). One older study demonstrated estrogenic activity in an acid fraction of the plant (Zenisek et al, 1960). However, many of the other available studies contain conflicting information regarding the estrogenic action. At this point it is uncertain whether the hop plant does exert estrogen-like activity.

Sedative/Hypnotic Action

The sedative/hypnotic effects of hops may be due to the volatile oils present in the plant. The same volatile oils may also be responsible for the antispasticity effect. Hops possess a pentobarbital sleep-enhancing effect without influencing motor behavior and an antideppresant action, when studied in the laboratory (Zanoli et al, 2005).

Antimicrobial Action

One small study shows that the antimicrobial effects of hops result from the bitter acid components (volatile oils) lupulone, humulene, and linalool (Leung, 1980).

Other Actions

Hops did not improve bone parameters in laboratory animals (Figard et al, 2007).

Product Availability

Cut herb, dry extract, extract, powdered dry herb, tea

Plant Part Used: Whole hops

Dosages

- Adult PO infusion: pour 8 oz boiling water over 0.4 g (1 tsp) ground hops cone, let stand 15 min
- Adult PO extract: 2-4 mg
- Adult PO cut herb: 0.5 g as a single dose (Blumenthal, 1998)
- Adult PO topical: apply to affected area as needed

Contraindications

Pregnancy category is 3; breastfeeding category is 3A.

Hops should not be used by persons who are hypersensitive to this product; persons who have breast, uterine, or cervical cancers; or those who suffer from a depressive condition. Hops are for short-term or intermittent use only. Use caution to avoid sedation in infants.

Continued

Side Effects/Adverse Reactions

CNS: Sedation, dizziness, decreased reaction time
GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions, including dermatitis and *anaphylaxis*

Interactions

Drug

Antidepressants, antipsychotics, antihistamines, alcohol, CNS depressants: Hops may cause increased central nervous system effects when taken concurrently with antidepressants, antipsychotics, antihistamines, alcohol, CNS depressants.
Cytochrome P450 *(carbamazepine, bupropion, orphenadrine, cyclophosphamide, citalopram, azole antifungals, macrolide antibiotics, omeprazole, warfarin, theophylline):* Hops may decrease the levels of these drugs.
Estrogens: Hops may cause increased hormonal levels when taken in conjunction with estrogen (theoretical).
Iron salts: Hops tea may decrease the absorption of iron salts; separate by at least 2 hours.

Herb

Sedative herbs: Hops may increase sedation when used with other sedating herbs (theoretical) (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Acylphloroglucinol		
Volatile oil	Humulene; Linalool; Lupulone	Antineoplastic; antimicrobial
	Myrcene	
Hormone	Estradiol	Estrogenic
Colupulone		Antiinfective
Flavonoid	Xanthohumol; Prenylnaringenin; Isoxanthohumol	Cytochrome P450 inhibitor
Avermectin		Antiinfective
Phenolic acid	Ferulic acid; Caffeic acid	
Tannin		

Client Considerations

Assess

- Assess the reason the client is using hops.
- Assess for hypersensitivity reactions and dermatitis. If present, discontinue the use of hops and administer an antihistamine or other appropriate therapy.
- Assess for anaphylaxis.
- Assess for central nervous system reactions: sedation, dizziness, and decreased reaction time.
- Assess for medications used (see Interactions).

Administer

- Instruct the client to store hops in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 3A.
- Caution the client to avoid sedation in the infant.
- Advise the client not to perform hazardous tasks such as driving or operating heavy machinery if sedation, dizziness, or decreased reaction time occurs.

Horehound

(hoer′hound)

Scientific name: *Marrubium vulgare*

Other common names: Common horehound, hoarhound, houndsbane, marvel, white horehound

Origin: Horehound is a perennial found in Asia, Europe, the United States, and Canada.

Uses

In traditional herbal medicine, horehound has been used to treat upper respiratory congestion, whooping cough, anorexia, asthma, bronchitis, tuberculosis, and diarrhea, to aid digestion and increase diuresis, and as an anthelmintic and a laxative. Its topical form has been used to promote wound healing.

Actions

Horehound has been used primarily in Mexico, Europe, and Asia. Currently, horehound's use as an ingredient in throat lozenges is common in the United States. Although its most common use is as an expectorant, no studies are available to support this action, and few studies support any uses or actions of this herb. One study (El Bardai et al, 2001) showed the hypotensive activity of horehound in hypertensive rats. Another study (Berrougui et al, 2006) suggests that horehound provides a natural source of antioxidants, which inhibit LDL, and increase the antiatherogenic potential of HDL. One study (Meyre-Silva et al, 2005) identified analgesic properties of horehound.

Product Availability

Capsules, cough lozenges, extract, powder, pressed juice, syrup, tea

Plant Parts Used: Dried leaves, flowering tops, fresh leaves

Dosages

- Adult PO extract: 10-40 drops in a small amount of water, tid
- Adult PO infusion: pour 8 oz boiling water over herb, let stand 10 min, strain; take 1-2 g up to tid
- Adult PO lozenges: use prn
- Adult PO powder: 1-2 g tid; 4.5 g daily (Blumenthal, 1998)
- Adult PO pressed juice: 2-6 tbsp daily (Blumenthal, 1998)

Contraindications

Class 2b herb (whole herb).

Because horehound is an abortifacient, it should not be used during pregnancy. Until more research is available, this herb should not be used during breastfeeding. It should not be given to children. Horehound should not be used by persons who are hypersensitive to it or who have arrhythmias.

Side Effects/Adverse Reactions

CV: *Arrhythmias*
ENDO: Hypoglycemia
GI: Nausea, vomiting, anorexia, diarrhea
INTEG: Hypersensitivity reactions

Interactions

Drug

Antiarrhythmics, emetics, ergots, sumatriptan: Antiarrhythmics, emetics (such as granisetron and ondansetron), ergots, sumatriptan may produce an increased serotonin effect when used with horehound; avoid concurrent use (theoretical).
Iron salts: Horehound tea may decrease the absorption of iron salts; separate by 2 hours.

Lab Test

Blood glucose: Horehound may decrease blood glucose.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil	Camphene; Cymene; Fenchene	
Diterpene bitter	Marrubiin	Bile secretion, expectorant, antiarrthymic
	Premarrubiin	
Tannin		Wound healing
Flavonoid	Chrysoeriol; Luteolin; Apigenin; Vicenin II	
Phenylethanoid glycoside	Marruboside	
	Acteside 2; Forsythoside; Arenarioside; Ballotetroside	

Client Considerations

Assess

- Assess the reason the client is using horehound.
- Assess for hypersensitivity reactions. If present, discontinue the use of horehound and administer an antihistamine or other appropriate therapy.

- Assess cardiac status: blood pressure, pulse, and ECG changes in clients with cardiac disorders.
- Assess for medications used (see Interactions).

Administer

- Horehound products should be kept away from heat and moisture.
- Use horehound for short-term use (<2 weeks).

Teach Client/Family

- Caution the client not to use horehound during pregnancy because it is an abortifacient. Until more research is available, caution the client not to use this herb during breastfeeding.
- Caution the client not to give horehound to children.
- Because of its many drug interactions, advise the client to consult a qualified herbalist before using horehound in any form other than lozenges.

Horse Chestnut

(hoers chehs'nuht)

Scientific names: *Aesculus hippocastanum, Aesculus california, Aesculus glabra*

Other common names: Aescin, buckeye, California buckeye, chestnut, escine, Ohio buckeye

Origin: Horse chestnut is a tree or shrub found worldwide.

Uses

Traditional uses of horse chestnut include treatment of fever, phlebitis, hemorrhoids, prostate enlargement, edema, inflammation, and diarrhea. It is commonly used in Germany to treat varicose veins.

Investigational Uses

Researchers are investigating the use of horse chestnut for treatment of venous insufficiency and varicose veins.

Actions

Antiinflammatory Action

Several studies have focused on the antiinflammatory action of horse chestnut. The chemical component aescin, a saponin present in horse chestnut, is responsible for its antiinflammatory properties (Matsuda et al, 1997). In another study of 30 patients with Widmer stage I or II central venous insufficiency, horse chestnut decreased the activity of lysosomal enzymes associated with venous insufficiency. In the study, participants received treatment with either tablets containing the substance (aescin) or a placebo. Those who received tablets containing aescin experienced significant improvement in ankle edema and venous filling rate. Subjective symptoms showed very little improvement (Shah et al, 1997).

Product Availability

Standardized extract, tincture

Plant Parts Used: Seeds, young bark

Dosages

- Adult PO standardized extract: 100-150 mg daily in two divided doses
- Adult PO tincture: 1-2 ml in ½ cup water, bid-qid (Smith, 1999)

Contraindications

Pregnancy category is 4; breastfeeding category is 3A.
Horse chestnut should not be given to children.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, *hepatotoxicity*
GU: *Nephropathy, nephrotoxicity*
INTEG: Pruritus, hypersensitivity, rash, urticaria
MS: Spasms
SYST: Bruising, *severe bleeding, shock; seeds are toxic*

Interactions

Drug

Anticoagulants *(anisindione, dicumarol, heparin, warfarin),* ***aspirin and other salicylates:*** Because of the presence of hydroxycoumarin, a chemical component of the herb that possesses anticoagulant activity, concurrent use of horse chestnut and anticoagulants, aspirin, and other salicylates increases the risk of severe bleeding. Do not use concurrently.
Antidiabetics: May increase the hypoglycemic effects of diabetes medications.
Iron salts: Horse chestnut tea may decrease the absorption of iron salts; separate by 2 hours.

Herb

Anticoagulant, antiplatelet herbs: Horse chestnut given with anticoagulant, antiplatelet herbs increases risk of bleeding (Jellin et al, 2008).
Hypoglycemic herbs: Horse chestnut given with hypoglycemic herbs increases hypoglycemia (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Steroid	Stigmasterol; Alpha-spinasterol; Beta-sitosterol	Antiinflammatory
Triterpene glycoside	Aescin	Decreased permeability of venous capillaries
Flavonoid	Quercetin; Kaempferol Astragalin; Isoquercetin; Rutin	Antiinflammatory
Coumarin	Aesculetin; Fraxin; Scopolin	
Allantoin		

= Pregnancy = Pediatric = Alert = Popular Herb

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Choline **Phytosterol** **Amino acid** **Citric acid** **Tannin**		Wound healing; antiinflammatory
Seeds Also Contain **Oleic acid**		

Client Considerations

Assess

- Assess the reason the client is using horse chestnut.
- Assess for symptoms of hepatotoxicity (increasing AST, ALT, and bilirubin levels; clay-colored stools; jaundice; right upper-quadrant pain). If any of these symptoms are present, discontinue the use of this herb.
- Assess for bleeding, bruising, and allergic reactions such as a rash or itching. If present, discontinue the use of this herb.
- Assess renal function if high dosage is suspected. Obtain blood urea nitrogen (BUN) and creatinine levels. Monitor for nephrotoxicity.
- Assess for medications used (see Interactions).
- Assess for toxicity (see Side Effects).

Administer

- Instruct the client to store horse chestnut in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 4 and breastfeeding category is 3A.
- Caution the client not to give horse chestnut to children.
- Warn the client of the life-threatening side effects of horse chestnut. Do not use older bark as it is poisonous.

Horseradish

(hawrs'ra-dish)

Scientific name: *Armoracia rusticana*

Other common names: Great mountain root, pepperrot, great raifort, red cole

Origin: Horseradish is a perennial native to Europe but is now found throughout the world.

Uses

Reported Uses

Horseradish is used as an anthelmintic, diuretic, and antibacterial, and to decrease joint inflammation and reduce edema. It may also be used to treat sinusitis and whooping cough. Horseradish is a pungent, warming herb.

Actions

Very little research is available on the actions of horseradish. Because the plant is poisonous, it should be used only as a flavoring in food unless under the supervision of a qualified herbalist. One study did show a hypotensive reaction in cats given horseradish IV (Sjaastad et al, 1984). Other studies (Agabeili et al, 2005; Weil et al, 2005) identified inhibition of growth of colon, lung, and stomach cancer cells. It also, possesses COX-1 inhibitory actions.

Product Availability

Fresh root, paste, powder

Plant Part Used: Roots

Dosages

- Adult PO fresh root: 2-4 g before meals
- Adult topical: 2% mustard oil maximum, applied prn

Contraindications

Class 2d herb (rhizome/root).

Because it is an abortifacient, horseradish should not be used during pregnancy. Until more research is available, this herb should not be used during breastfeeding. It should not be given to children younger than 4 years of age. Persons with hypothyroidism, hyperthyroidism, renal disease, gastrointestinal ulcers, or hypersensitivity to this herb should avoid its use. Horseradish is toxic if used internally in large quantities.

Side Effects/Adverse Reactions

EENT: Mucous membrane irritation
GI: Nausea, vomiting, anorexia, diarrhea
INTEG: Hypersensitivity reactions

Interactions

Drug

Thyroid replacement: Horseradish may interfere with thyroid replacement therapy (theoretical) (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Coumarin	Scopoletin; Aesculetin; Caffeic acid; Hydroxycinnamic acid	
Vitamin	C	
Peroxidase enzyme		

= Pregnancy = Pediatric = Alert = Popular Herb

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Resin		
Flavonoid	Quercetin; Kaempferol	Antiinflammatory
Asparagine		
Glucosinolate	Mustard oil	Antiinflammatory, respiratory support

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of horseradish and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store horseradish products in a cool, dry place, away from heat and moisture. Fresh roots should be kept buried.

Teach Client/Family

- Caution the client not to use horseradish during pregnancy because it is an abortifacient. Until more research is available, caution the client not to use this herb during breastfeeding.
- Caution the client not to give horseradish to children younger than 4 years of age.
- Advise the client to use horseradish internally only as a food flavoring or under the direction of a qualified herbalist. The horseradish plant is toxic if used internally in large quantities.

Horsetail

(hawrs'tayl)

Scientific name: *Equisetum arvense*

Other common names: Bottle brush, corn horsetail, dutch rushes, horse willow, horsetail grass, paddock pipes, pewterwort, scouring rush, shave grass, toadpipe

Origin: Horsetail is a perennial pteridophyte found throughout Europe and in parts of Asia.

Uses

Horsetail is used internally to increase the strength of bones, teeth, nails, and hair. It has also been used internally as an antiinfective, diuretic, and anticancer treatment, as well as to decrease gout, prevent urinary stones, treat menorrhagia, and increase strength. It is used externally to promote wound healing.

Actions

This herb exerts mild diuretic activity but is not recommended to treat any condition. Horsetail may increase sodium and water excretion. Anecdotal reports characterize it as an astringent used to stop bleeding, decrease inflammation, and promote wound healing. However, no evidence supports any of these claims. One study (Radulovic et al, 2006) identified antimicrobial actions against a panel of microorganisms. Another study (Dos Santos et al, 2005) found that horsetail possesses sedative and anticonvulsant effects when studied in the laboratory.

Product Availability

Crude herb, fluid extract; component in combination products

Plant Part Used: Dried green aerial stems

Dosages

- Adult PO fluid extract: initially, 20-40 drops tid-qid; maintenance 20-40 drops bid-tid (1:1 dilution in 25% alcohol)
- Adult PO infusion: place 1.5 g herb in 8 oz water; take 2-4 g/day
- Adult PO tea: pour 8 oz boiling water over 2-3 g herb, boil 5 min, let stand 15 min, strain
- Adult topical: 10 g herb/L water, used as a compress or bath prn

Contraindications

Pregnancy category is 3; breastfeeding category is 2A.

Horsetail should not be given to children. This herb should not be used by persons with hypersensitivity to it or those with edema, cardiac disease, renal disease, or nicotine sensitivity. Horsetail contains nicotine and should not be used for prolonged periods. The active chemicals in this herb are absorbed through the skin and can cause death.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia

INTEG: Hypersensitivity reactions

Nicotine toxicity: *Weakness, dizziness, fever, loss of weight, feeling of cold in extremities (very large quantities)*

SYST: Thiamine deficiency

Interactions

Drug

Cardiac glycosides (digoxin): Horsetail may increase the toxicity of cardiac glycosides and increase hypokalemia.

Diuretics: Horsetail may increase the effect of diuretics; avoid concurrent use (theoretical).

Lithium: Horsetail taken with lithium may cause dehydration and lithium toxicity.

Herb

Adonis, lily of the valley, squill: Horsetail increases the action of *Adonis vernalis, convalleria majalis, Scillae* bulbs when taken concurrently.

Tobacco: Horsetail may cause increased CNS stimulation when used with tobacco; avoid concurrent use.

Food

Thiamine: Horsetail may interfere with the absorption of thiamine.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Flavonoid	Isoquercitrin; Equisetrin; Galuteolin	Diuretic Diuretic
Sterol	Cholesterol; Campesterol; Isofucosterol; Beta-sitosterol	
Alkaloid	Nicotine	Central nervous system stimulant
	Palustrinine; Palustrine	
Thiaminase		Thiamine deficiency
Minerals	Silica; Selenium; Zinc	

H

Client Considerations

Assess

- Assess the reason the client is using horsetail.
- Assess for hypersensitivity reactions. If present, discontinue the use of horsetail and administer an antihistamine or other appropriate therapy.
- Assess for the use of medications, caffeinated foods, and tobacco. Xanthines, cerebral stimulants, nicotine, coffee, tea, cola, and tobacco will cause increased central nervous system stimulation when used in conjunction with horsetail (see Interactions).
- Assess for nicotine toxicity: weakness, dizziness, fever, weight loss, and feeling of cold in extremities. Horsetail would have to be taken in large quantities to cause a toxic reaction.

Administer

- Instruct the client to store horsetail products in sealed container away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 2A.
- Caution the client not to give horsetail to children.
- Caution the client not to confuse medicinal horsetail with other *Equisetum* spp.
- Warn the client about possible nicotine toxicity and the many drug, food, and herb interactions of horsetail.
- Warn the client to keep horsetail away from children. The active chemicals in this herb are absorbed through the skin and can cause death.

Huperzine A

(hoo-pehr′ zeen)

Scientific name: Huperzine A

Other common names: HupA, Selagine

Origin: Huperzine A is a synthetic.

Uses

Huperzine A is used for dementia in Alzheimer's disease and for muscle weakness in myasthenia gravis.

Actions

This herb is thought to be helpful in Alzheimer's disease, as well as in other dementias. It crosses the blood-brain barrier and is a reversible inhibitor of acetylcholinesterase. Huperzine A increases acetycholine for up to 3 or more hours. It seems to possess beneficial effects of general cognitive, behavioral disturbance and functional performance (Li et al, 2008; Peng et al, 2007).

Product Availability

Tablets, IM

Dosages

Alzheimer's disease

- Adult PO tablets: 50-200 mcg bid

Senile Dementia

- Adult PO tablets: 30 mcg bid

Myasthenia Gravis

- Adult IM: 400 mcg/day

Contraindications

Huperzine A should not be used in pregnancy or breastfeeding until more research is available. It is contraindicated in persons with seizures, PUD, GI ulcers, bradycardia, or other rhythm disorders.

Side Effects/Adverse Reactions

CNS: Sweating, blurred vision, hyperactivity
GI: Nausea, anorexia, vomiting, diarrhea

Client Considerations

Assess

- Assess the reason the client is using hyperzine A.

Administer

- Keep huperzine A in a cool, dry area, away from excessive light.

Teach Client/Family

- Teach the patient that hyperzine A should not be used in pregnancy and breastfeeding until more research is available.

Hyssop

(hi'suhp)

Scientific name(s): *Hyssopus officinalis*

Origin: Hyssop is a perennial found in the Mediterranean, the United States, and Canada.

Uses

Hyssop has been used as a fragrance in soaps, perfumes, and cosmetics, as well as a flavoring in food. It has been used as an antiasthmatic, antispasmotic, and expectorant, as well as to treat sore throat (used as a gargle) and for wound healing.

Investigational Uses

Initial evidence indicates that hyssop may be useful as an antiviral to treat HIV infections. Hyssop has also been used to treat herpes infections.

Actions

Hyssop is a member of the mint family. Little research is available to confirm any of its uses or actions.

Antiretroviral/Antiviral Action

Initial research indicates that hyssop may be useful in the treatment of HIV-1 infections (Gollapudi et al, 1995) and possibly herpes infections. One polysaccharide isolated from hyssop was shown to inhibit HIV replication. Another study showed that the tannins and caffeic acid found in hyssop exerted antiviral activity (Kreis et al, 1990).

Other Actions

Anecdotal reports suggest the use of hyssop as a stimulant, expectorant, sedative, and antispasmodic. One study (Lu et al, 2002) identified the muscle-relaxing activity of *Hyssopus officinalis* in laboratory animals. Another study identified the antiplatelet action of the chemical components, phenylpropanoids (Tognolini et al, 2006).

Product Availability

Essential oil, fluid extract, tea, tincture

Plant Parts Used: Essential oil from leaves and flower tips

Dosages

- Adult PO tea: cover 1 tsp herb with 8 oz boiling water, let stand 15 min, may take tid
- Adult PO tincture: 2-4 ml tid

Contraindications

Class 2b herb (whole herb).

Because hyssop is an abortifacient, it should not be used during pregnancy. Until more research is available, this herb should not be used during breastfeeding. It should not be given to children younger than 2 years of age. Persons with hypersensitivity to hyssop should not use it.

Side Effects/Adverse Reactions

CNS: *Seizures*
GI: Nausea, vomiting, anorexia, diarrhea
INTEG: Hypersensitivity reactions

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Terpenoid	Marrubiin; Ursolic acid; Oleanolic acid	Cardioactive; stimulates bronchial secretions

Continued

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Volatile oil	Linalool; Camphor; Pinochamphone; Thujone; Alpha-pinene; Beta-pinene; Limonene; Camphene; Alphaterpinene; Bornylacetate; Isopinocamphone	Muscle relaxant
Flavonoid	Hesperidiin Diosmetin	
Tannin		Wound healing; antiviral
Resin		
Acid	Caffeic acid	Antiviral
Polysaccharide	MAR-10	Anti-HIV
Phenylpropanoids		Antiplatelet

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of hyssop and administer an antihistamine or other appropriate therapy.
- Determine the reason the client is using hyssop and suggest more effective alternatives.

Administer

- Children, geriatric clients, and clients who are emaciated should use only low doses of hyssop.

Teach Client/Family

- Caution the client not to use hyssop during pregnancy because it is an abortifacient. Until more research is available, caution the client not to use this herb during breastfeeding.
- Caution the client not to give hyssop to children younger than 2 years of age.
- Advise the client to use hyssop only under the direction of a qualified herbalist if using the herb for an extended period.
- Warn the client not to confuse *Hyssopus officinalis* with other plants commonly called "hyssop." These other plants are not members of the *Hyssopus* genus or its family, Labiatae.

Iceland Moss

(ise′luhnd maws)

Scientific name: *Cetraria islandica*

Other common names: Consumption moss, eryngo-leaved liverwort, Iceland lichen

Origin: Iceland moss is a lichen found in Iceland and other parts of the Northern hemisphere.

Uses

Iceland moss has been used to treat the common cold, cough, bronchitis, inflammation, and anorexia.

Investigational Uses

Initial research documents the use of Iceland moss to treat bacterial and HIV-1 infections.

Actions

Iceland moss may be contaminated with lead.

Antioxidant, Antimicrobial, Antiretroviral, Anticancer, and Antiinflammatory Actions

Iceland moss has demonstrated significant antimicrobial effects against *Streptococcus pyogenes, Staphylococcus aureus, Mycobacterium tuberculosis,* and *Helicobacter pylori* (Ingolfsdottir et al, 1985, 1997). The chemical component responsible is protolichesterinic acid. Iceland moss has also been shown to exert significant activity against HIV-1 infection and certain cancers (Ingolfsdottir, 1994). *Cetraria islandica* showed significant antioxidant effect depending on concentration of sample. The conclusion was that *C. islandia* is a potential source of natural antioxidant (Gulcin et al, 2002). Another study (Freysdottir et al, 2008) identified the antiinflammatory effect of Iceland moss, possibly by changing the cytokine secretion bias.

Product Availability

Capsules, creams, crude herb, lozenges, tincture

Plant Parts Used: All parts of the lichen

Dosages

Cough and Cold

- Adult PO lozenges: take one lozenge prn

Other

- Adult PO decoction: mix 1 tsp shredded moss in 8 oz water, boil 3 min, strain, take bid
- Adult PO tincture: 1-2 ml bid-tid

Contraindications

Class 1 herb (decoction, infusion); class 2d herb (alcoholic extract, powder, thallus). Until more research is available, Iceland moss should not be used during pregnancy and breastfeeding. It should not be given to children. This herb should not be used by persons with gastric or duodenal ulcers or by those with hypersensitivity to it.

Continued

Side Effects/Adverse Reactions

GI: Nausea, vomiting, gastritis, anorexia, *hepatotoxicity*
INTEG: Hypersensitivity reactions

Interactions

Drug

Oral medications: Iceland moss can decrease absorption of oral medications (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Polysaccharide	Lichenin; Isolichenin	Pharyneal soothing agent
Lichenic acid	Protolichesterinic acid Fumarprotocetraric acid; Lichesterinic acid	Antimicrobial

Client Considerations

Assess

- Assess the reason the client is using Iceland moss.
- Assess for hypersensitivity reactions. If present, discontinue the use of Iceland moss and administer an antihistamine or other appropriate therapy.
- Assess for signs of hepatotoxicity: jaundice, clay-colored stools, and right upper-quadrant pain. Monitor hepatic function studies: AST, ALT, and bilirubin.

Administer

- Instruct the client to store Iceland moss in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use Iceland moss in children or those who are pregnant or breastfeeding until more research is available.
- Advise the client that very little research is available that documents any actions or uses of Iceland moss.
- Advise the client that prolonged use can lead to GI ulceration and liver disease.

Indigo

(in′di-goe)

Scientific name: *Indigofera* spp.

Other common name: Qingdai

Origin: Indigo is a perennial shrub found in several regions of the world.

= Pregnancy = Pediatric = Alert = Popular Herb

Uses

Indigo has been used in traditional Chinese medicine to purify the liver and to treat inflammation, pain, and fever. Other uses include treatment of diabetes and mumps.

Investigational Uses

Indigo may be used to treat bacterial fungal infections.

Actions

One species of indigo *(Indigofera spicata)* contains substances that are hepatotoxic and teratogenic. Other indigo species do not cause these toxicities. *Indigofera tinctoria* has been shown to prevent hepatotoxicity in the case of carbon tetrachloride poisoning (Anand et al, 1981). Some species have shown promise in the inhibition of certain cancers. However, insufficient research supports this action at this time. One study (Chakrabarti et al, 2006) identified the insulin-sensitizing property of indigo. It is used in rural India for its antidiabetic activity. In the laboratory it reduced plasma glucose by 63%. Indigo may possess antidyslipidemic activity (Puri et al, 2007) and hepatoprotective effects (Rajkapoor et al, 2006).

Product Availability

Powder, tablets

Plant Parts Used: Branches, leaves

Dosages

No dosage consensus exists.

Contraindications

Because birth defects have occurred in babies born to animals given *Indigofera spicata,* indigo should not be used during pregnancy. Until more research is available, this herb should not be used during breastfeeding. It should not be given to children. Persons who are hypersensitive to indigo should not use it.

Side Effects/Adverse Reactions

EENT: Redness of the eye
GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions, dermatitis

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Glucoside	Indican	Dye
Xanthene	Tetrahydroxanthene	
Indigofera spicata		
Also Contains		
Indospicine		Teratogenic; hepatotoxic
Indigtone		Hepatoprotective

Client Considerations

Assess

- Assess the reason the client is using indigo.
- Assess for hypersensitivity reactions and dermatitis. If present, discontinue the use of indigo and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store indigo in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use indigo during pregnancy. Birth defects have occurred in babies born to animals given *Indigofera spicata.* Until more research is available, caution the client not to use this herb during breastfeeding.
- Caution the client not to give indigo to children.
- Advise the client to avoid getting indigo in the eye.
- Advise the client to learn to distinguish false, wild, and bastard indigo *(Baptisia tinctoria)* from *Indigofera* spp. used for medicinal purposes.

Inosine

(in′ uh-seen)

Scientific name: 2,3-diphosphoglycerate

Other common name: Hypoxanthine riboside

Origin: Inosine is a synthetic.

Uses

Inosine is used to enhance athletic stamina and performance.

Actions

There is little research for inosine use in performance enhancement. It is thought to increase axon growth in damaged nerve cells (Jellin et al, 2008). There is a protective mechanism in platelet activation and cerebral ischemic damage (Hsiao et al, 2005).

Product Availability

Tablets, powder

Dosages

- Adult PO: 5-6 g/day

Contraindications

Inosine should not be used in children or those who are pregnant, breastfeeding, or hypersensitive to this product.

Client Considerations

Assess

- Assess the reason the client is using inosine.

Administer

- Keep inosine in a dry area, away from direct sunlight.

Teach Client/Family

- Caution the client not to use inosine in children or those who are pregnant or breastfeeding until more research is available.

Irish Moss

(ire'ish maws)

Scientific name: *Chondrus crispus*

Other common names: Carrageen, carageenan, chondrus

Origin: Irish moss is a seaweed found in Europe and on the coasts of Canada.

I

Uses

Irish moss is used to treat diarrhea, gastritis, and bronchitis.

Investigational Uses

Research is underway to determine the effectiveness of Irish moss as an antiinflammatory and as a vehicle for delivery of gastrointestinal drugs.

Actions

Traditionally, Irish moss has been used to treat cough, bronchitis, and diarrhea. However, no research supports these traditional uses, and little research is available on this herb in general. One study of laboratory animals did show an antiinflammatory action when carrageenan, one of the chemical components, was injected into inflamed paws. Other proposed actions that have not been studied include potential use as an anticholesteremic, anticoagulant, and antihypertensive. The food and drug industries use Irish moss as a binder, emulsifier, and stabilizer.

Product Availability

Component of: cream, lotion, ointment, toothpaste, tea, granules in combination with other herbs

Plant Part Used: Whole moss

Dosages and Routes

- Adult decoction: boil 1 oz of dried moss in 1-1$^1/_2$ pints of water for 15 min, strain, drink 1 cup tid

Contraindications

Until more research is available, Irish moss should not be used during pregnancy and breastfeeding. It should not be given to children. This herb should not be used by persons with active gastrointestinal bleeding or a history of peptic ulcers, or by those with hypersensitivity to it.

Side Effects/Adverse Reactions

CV: Decreased blood pressure

GI: Nausea, vomiting, anorexia, diarrhea, abdominal pain, *gastrointestinal bleeding*

Continued

Side Effects/Adverse Reactions—cont'd

GU: Renal changes (theoretical)
INTEG: Hypersensitivity reactions

Interactions

Drug

Anticoagulants *(heparin, warfarin)*, ***antihypertensives:*** Irish moss may increase the effects of anticoagulants, antihypertensives; avoid concurrent use.
Oral medications: Irish moss may decrease absorption of oral medications.
Salicylates *(aspirin):* Irish moss may pose an increased risk of bleeding when used with salicylates; avoid concurrent use.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Carrageenan		Antiinflammatory
Iodine		
Bromine		
Mineral	Iron; Magnesium; Calcium; Sodium	
Vitamin	A; B	

Client Considerations

Assess

- Assess the reason the client is using Irish moss.
- Assess for hypersensitivity reactions. If present, discontinue the use of Irish moss and administer an antihistamine or other appropriate therapy.
- Assess for suspected gastrointestinal bleeding: black tarry stools, guaiac stools.
- Assess for the use of antihypertensives, anticoagulants, and salicylates (see Interactions).

Administer

- Instruct the client to store Irish moss in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use Irish moss in children or those who are pregnant or breastfeeding until more research is available.

Jaborandi

(zhah-boer-ahn′dee)

Scientific names: *Pilocarpus jaborandi, Pilocarpus microphyllus, Pilocarpus pinnatifolius*

Other common names: Arruda brava, arruda do mato, Indian hemp, jamguarandi, juarandi, pernambuco jaborandi

Origin: Jaborandi is found in Brazil.

Uses

The primary use of jaborandi is to reduce the intraocular pressure caused by glaucoma and to treat xerostomia. It is also used to treat diabetes and nephritis, to stimulate milk flow in nursing mothers, and as an antiinflammatory. Jaborandi has been used topically for baldness and to treat skin disorders such as psoriasis and eczema.

Actions

The chemical component pilocarpine is responsible for the pharmacologic action of jaborandi. Most of the information available on this herb is derived from the mainstream pharmacologic literature on pilocarpine. Jaborandi may be administered either orally or ophthalmically. When taken orally, it acts on the cholinergic receptors, stimulating the exocrine glands and producing muscarinic effects. Gastric and bronchial secretions increase, as does motility of the urinary tract and gallbladder.

Ophthalmic Action

When used as an ophthalmic, jaborandi is a direct-acting miotic. This herb duplicates the muscarinic effects of acetylcholine. The result is pupillary constriction, increased aqueous humor outflow, and decreased intraocular pressure.

Product Availability

Essential oil, extract, powder, tincture

NOTE: For information about pilocarpine (eye drops), refer to the pharmacologic literature.

Plant Part Used: Leaves

Dosages

Ophthalmic

- Adult topical drops: 1-2 gtt tid

Other

- Adult PO extract: 20-30 drops
- Adult PO powdered leaves: 10-60 grains
- Adult PO tincture: 1 dram

Contraindications

Class 2b herb (leaf).

Until more research is available, jaborandi should not be used during pregnancy and breastfeeding. It should not be given to children. Jaborandi should not be used by persons with uncontrolled asthma, angle-closure glaucoma, or iritis or by persons with hypersensitivity to it. Persons with chronic obstructive pulmonary disease, bronchitis, cardiac disease, biliary tract disease, cholelithiasis, retinal disease, psychiatric disorders, neurologic disorders, or cognitive disorders should avoid the use of jaborandi.

Continued

Side Effects/Adverse Reactions

CNS: Tremors, dizziness, headache, weakness
CV: Hypertension, tachycardia, edema
EENT: Rhinitis, amblyopia, epistaxis; blurred vision, stinging, eye pain (ophthalmic use)
GI: Nausea, vomiting, anorexia, dysphagia
GU: Urinary frequency
INTEG: Hypersensitivity reactions, flushing, sweating

Interactions

Drug

Anticholinergic: The effects of jaborandi are decreased when used internally with anticholinergics.
Beta-blockers: Adverse cardiovascular reactions are increased when jaborandi is used internally with beta-blockers; do not use concurrently.
Bethanechol, cholinergics *(ophthalmic):* Increased cholinergic effects occur when jaborandi is used internally with bethanechol, ophthalmic cholinergics.
NSAIDs *(topical):* The action of jaborandi (ophthalmic route) is decreased when it is used with topical NSAIDs; do not use concurrently.

Pharmacology

Pharmacokinetics

Jaborandi is absorbed well when taken internally. It is excreted via urine, metabolized as an unchanged drug.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid	Pilocarpine	Direct-acting miotic; cholinergic
	Isopilocarpine; Pilocarpidine	
Jaborine		
Pilosine		
Tannic acid		
Jaboric acid		
Pilocarpic acid		
Volatile oil		

Client Considerations

Assess

- Assess the reason the client is using jaborandi.
- Assess for hypersensitivity reactions. If present, discontinue the use of jaborandi and administer an antihistamine or other appropriate therapy.
- Assess for dizziness, headache, weakness, blurred vision, hypertension, and tremors. If present, the herb dose may need to be reduced.
- Assess for medication use (see Interactions).

Administer

- Instruct the client to use the lowest PO dose possible.
- Store in dry, cool environment.
- Use by ophthalmic route tid.

Teach Client/Family

- Caution the client not to use jaborandi in children or those who are pregnant or breastfeeding until more research is available.
- Advise the client that visual changes such as blurred vision may occur. The client should avoid driving or operating machinery until the particular effects are known.
- Advise the client that when jaborandi is used via the ophthalmic route, the eyes initially may sting and headache, brow ache, and decreased night vision may occur.
- Advise client not to confuse pilocarpine jaborandi or paraguay jaborandi with this agent (Jellin et al, 2008).

Jamaican Dogwood ◆

(jah-may'kuhn dawg'wood)

Scientific name: *Piscidia erythrina*

Other common names: Fish poison tree, fishfuddle, West Indian dogwood

Origin: Jamaican dogwood is now found in the West Indies, the northern portion of South America, and the southern portion of the United States.

Uses

Jamaican dogwood has been used to treat insomnia, anxiety, asthma, migraine, dental pain, nerve pain, menstrual disorders such as dysmenorrhea, and the pain of labor. Most of its uses are intended to produce mild to moderate analgesia. Because of its toxicity, this herb is rarely used to treat any condition.

Actions

Very little information is available on Jamaican dogwood, and no primary research is available for any of its uses or actions. It is believed to exert an antispasmodic action, but research does not confirm this. Because of its toxicity, this herb is no longer in use to any significant extent. Its use should be discouraged and safer alternatives recommended.

Product Availability

Bark strips, dried bark, dried roots, fluid extract, tincture

Plant Parts Used: Bark, roots

Dosages

- Adult PO dried bark/dried roots: 2-4 g daily divided tid
- Adult PO fluid extract: 5-20 drops, increasing to a maximum of 1-2 drams daily
- Adult PO tea: 1 tsp in 8 oz water, simmer 10-15 min
- Adult PO tincture: 2-3 ml bid-tid (taken at bedtime if used to treat insomnia)

Contraindications

Pregnancy category is 6; breastfeeding category is 4A.
Jamaican dogwood should not be given to children. This herb should not be used by elderly persons, those with cardiovascular disease such as arrhythmias or hypotension, or those with hypersensitivity to it. Jamaican dogwood should not be used intravenously. This is a toxic herb that is not recommended for use.

Side Effects/Adverse Reactions

CNS: Dizziness, sedation
GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions
Toxicity: *Sweating, tremors,* salivation, numbness

Interactions

Drug

Alcohol, antihypertensives, barbiturates, opioids: Jamaican dogwood may increase the effects of alcohol, antihypertensives, barbiturates, opioids; avoid concurrent use.
Antihistamines: Antihistamines may produce an increased effect when used with Jamaican dogwood; avoid concurrent use.

Herb

Sedative herbs: Jamaican dogwood may increase sedation when used with sedative herbs.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Isoflavone		Spasmolytic
Rotenoid	Millettone; Isomillettone; Sumatrol; Dehydromillettone; Rotenone	Carcinogenic
Tannin		Wound healing
Soflavone	Piscidone; Listetin; Erythbigenin; Piscerythrone; Ichthynone	
Tataric acid	Piscidic fukiic; Methlfukiic	

Client Considerations

Assess

- Assess the reason the client is using Jamaican dogwood.
- Assess for hypersensitivity reactions. If present, discontinue the use of Jamaican dogwood and administer an antihistamine or other appropriate therapy.
- Assess for cardiovascular disease such as hypotension, bradycardia, and arrhythmias.
- Assess for use of alcohol, antihistamines, antihypertensives, barbiturates, and opioids (see Interactions).
- Assess for toxicity symptoms (sweating, tremors).

Administer

- Inform the client that Jamaican dogwood may be taken PO in the form of dried products (bark, root, or bark strips), extract, tincture, or tea.
- Instruct the client to store Jamaican dogwood products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 6 and breastfeeding category is 4A.
- Caution the client not to give Jamaican dogwood to children.
- Advise the client that Jamaican dogwood causes drowsiness and sedation.
- Caution the client not to perform hazardous activities such as driving or operating heavy machinery until physical response to the herb can be evaluated.
- Warn the client that this herb cannot be recommended for any use or action because of its toxicity.

Jambul

(jam-bewl′)

Scientific name: *Syzygium cuminii*

Other common names: Black plum, jamba, jambolana, jambolo, jambool, jambu, jambula, jambulon plum, java plum

J

Origin: Jambul is a tree found in India and Sri Lanka.

Uses

Jambul has been used in traditional herbal medicine as an aphrodisiac and an antispasmodic, as well as an aid in digestion. It is also used to treat diarrhea, flatulence, and diabetes mellitus.

Investigational Uses

Initial research indicates that jambul decreases inflammation.

Actions

Hypoglycemic Action

Jambul has been used in Brazil for its hypoglycemic action. However, in one study using laboratory animals with streptozocin-induced diabetes, no difference was found in blood glucose levels when the animals were given jambul tea for 14 to 95 days as a water substitute (Teixera et al, 1997).

Product Availability

Decoction, tea

Plant Parts Used: Fruit, leaves, seeds

Dosages

- Adult PO: powdered seed 0.3-2 g.
- Adult liquid extract: 4-8 ml (Jellin et al, 2008)

Contraindications

Until more research is available, jambul should not be used during pregnancy and breastfeeding. It should not be given to children. This herb should not be used by persons with hypersensitivity to it.

Continued

Side Effects/Adverse Reactions

GI: Nausea, anorexia
INTEG: Hypersensitivity reactions

Interactions

Drug

Antidiabetics: Jambul may increase the effects of antidiabetics; avoid concurrent use (theoretical).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Fatty acid	Oleic acid; Myristic acid; Linoleic acid; Palmitic acid	
Flavonoid	Quercetin	Antiinflammatory
Tannin	Corilagin; Ellagic; Galloyglucose	
Essential oils		Antibacterial

Client Considerations

Assess

- Assess the reason the client is using jambul.
- Assess for hypersensitivity reactions. If present, discontinue the use of jambul and administer an antihistamine or other appropriate therapy.
- Monitor blood glucose in diabetic clients; identify antidiabetes agents used (see Interactions).

Administer

- Instruct the client to store jambul products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use jambul in children or those who are pregnant or breastfeeding until more research is available.
- Advise client not to confuse jambolan bark with jambolan seeds (Jellin et al, 2008).

Jimsonweed

(jim′suhn-weed)

Scientific name: *Datura stramonium*

Other common names: Angel's trumpet, angel tulip, apple-of-Peru, devil weed, devil's apple, devil's trumpet, Estramonio, green dragon, gypsyweed, inferno, Jamestown weed, loco seeds, locoweed, mad apple, moon weed, stramoine, stechapfel, stinkweed, thorn apple, tolguacha, trumpet lily, zombie's cucumber

Origin: Jimsonweed is a weed found in most temperate and subtropical parts of the world.

Uses

Although jimsonweed is highly toxic, it has been used to treat asthma, Parkinsonism, and irritable bowel syndrome, as well as to reduce gastrointestinal secretions. It also has been used as a hallucinogen.

Actions

Most of the information available on jimsonweed comes from mainstream pharmacologic literature regarding its component alkaloids. Its chemical components exert anticholinergic properties and block acetylcholine at parasympathetic neuroeffector sites. The blocking of vagal stimulation in the heart increases both cardiac output and heart rate and dries secretions. The chemical components responsible for these actions are atropine, hyoscine, scopolamine, and hyoscyamine. This herb is very poisonous to animals and humans, if it is not used correctly.

Product Availability

Cigarettes, crude herb, rectal suppositories

Plant Parts Used: Flowering tops, leaves, roots

Dosages

- Adult PO: 75 mg (Clause, 1961)

Contraindications

Until more research is available, jimsonweed should not be used during pregnancy and breastfeeding. It should not be given to children. Jimsonweed should not be used by persons with hypersensitivity to this plant or belladonna alkaloids. It should not be used by persons with angle-closure glaucoma, obstruction of the gastrointestinal or urinary system, thyrotoxicosis, ulcerative colitis, prostatic hypertrophy, tachycardia, tachyarrhythmia, asthma, acute hemorrhage, hepatic disease, myocardial ischemia, or central nervous system disorders such as myasthenia gravis. Persons with spastic paralysis, gastric ulcers, hyperthyroidism, chronic obstructive pulmonary disease, hypertension, congestive heart failure, and renal disease should avoid its use. The jimsonweed plant is toxic, especially the seeds.

Side Effects/Adverse Reactions

CNS: Headache, dizziness, confusion, anxiety, flushing, drowsiness, insomnia, weakness, involuntary movements, decreased sweating, increased/decreased body temperature, *coma, seizures, death (plant ingestion)*
CV: Hypotension, paradoxical bradycardia, angina, premature ventricular contractions, hypertension, tachycardia, ectopic ventricular beats
EENT: Blurred vision, photophobia, eye pain, pupil dilatation, nasal congestion
GI: Nausea, vomiting, anorexia, dry mouth, abdominal pain, constipation, abdominal distention, altered taste
GU: Retention, hesitancy, impotence, dysuria
INTEG: Hypersensitivity reactions, rash, urticaria, contact dermatitis, dry skin, flushing

Interactions

Drug

Amantadine, anticholinergics, MAOIs, tricyclic antidepressants: Increased anticholinergic effects result when jimsonweed is used with amantadine, anticholinergics, MAOIs, or tricyclic antidepressants.

Continued

Interactions—cont'd

Antacids: Antacids decrease the action of jimsonweed.
Phenothiazines: Jimsonweed decreases the action of phenothiazines.

Herb

Aloe, buckthorn, cascara, chinese rhubarb, senna: The action of jimsonweed is increased in cases of chronic use or abuse of aloe, buckthorn, cascara, chinese rhubarb, or senna.

Pharmacology

Pharmacokinetics

The atropine component is well absorbed, metabolized by the liver, and excreted by the kidneys. It crosses the placenta and is excreted in breast milk.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Seeds and Leaves Contain		
Alkaloid	Atropine; Scopolamine; Hyoscyamine; Hyoscine	Anticholinergic
Seeds Also Contain		
Fatty acid	Palmitic acid; Stearic acid; Oleic acid; Linoleic acid; Lignoceric acid	
All Plant Parts Contain		
Tannin		Wound healing
Coumarin		

Client Considerations

Assess

- Assess the reason the client is using jimsonweed.
- Assess for hypersensitivity reactions, such as rash, urticaria, and contact dermatitis. If present, discontinue the use of jimsonweed and administer an antihistamine or other appropriate therapy.
- Assess respiratory status, including rate, rhythm, wheezing, dyspnea, and engorged neck veins. If any of these symptoms are present, jimsonweed use should be discontinued immediately.
- Assess for increased intraocular pressure, including blurred vision, nausea, vomiting, and increased tearing. If any of these symptoms are present, jimsonweed use should be discontinued immediately.
- Assess cardiac status, including rate, rhythm, character, and blood pressure.
- Assess for medications and herbs used (see Interactions).

= Pregnancy = Pediatric = Alert = Popular Herb

Administer

- Instruct the client to increase bulk and water in the diet if constipation occurs.
- Instruct the client to use hard candy or gum and rinse the mouth frequently if dryness of the mouth occurs.

Teach Client/Family

- Caution the client not to use jimsonweed in children or those who are pregnant or breastfeeding until more research is available.
- Warn the client that the jimsonweed plant is toxic, especially the seeds.
- Caution the client to report blurred vision, chest pain, and allergic reactions immediately.
- Caution the client not to perform strenuous activities in high temperatures while using jimsonweed. Heat stroke may occur.
- Advise the client to avoid consumption of jimsonweed because its alkaloid chemical components are similar to those of the deadly nightshade plant. Very little research exists on jimsonweed.
- Caution the client to use jimsonweed only under the supervision of a qualified herbalist. This herb is considered unsafe.

Jojoba

(hoe-hoe'bah)

Scientific names: *Simmondsia chinesis, Simmondsia californica*

Other common names: Deernut, goatnut, pignut

Origin: Jojoba is a shrub found in Mexico and the southwestern region of the United States.

Uses

Jojoba has been used primarily to treat skin disorders including scaling, eczema, psoriasis, seborrhea and chapped, dry skin. It is a component of many common skin products. Anecdotal information promotes the use of jojoba to treat hair loss and acne and to decrease the appearance of wrinkles.

Actions

Jojoba has been used for many years as a component in cosmetics, suntan lotions, shampoos, and hair conditioners. Primary research is lacking, and only two studies are available that relate to the medicinal uses of jojoba. One study evaluated rabbits given a 2% jojoba dietary supplement. After supplementation, cholesterol levels decreased by 40%. However, the mechanism of action was not studied (Clarke et al, 1981). Another study evaluated the antioxidant effects of jojoba, which are believed to result from its alpha-tocopherol content (Mallet et al, 1994). Most of the uses of jojoba are based on years of anecdotal information.

Product Availability

Beads, butter, crude wax; component of Chapstick, cream, dandruff shampoo, lipstick, lotion, soap

Plant Part Used: Oil from seeds

Dosages

No dosage information is available.

Side Effects/Adverse Reactions

INTEG: Hypersensitivity reactions, contact dermatitis

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Fatty acid	Alpha-tocopherol	Emollient
Alcohol		
Simmondsin		
Vitamin	B; E	
Mineral	Chromium; Zinc; Copper	
Wax	Eurucic acid	Myocardial fibrosis

Client Considerations

Assess

- Assess the reason the client is using jojoba.
- Assess for hypersensitivity reactions and contact dermatitis. If present, discontinue the use of jojoba and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to use jojoba topically only. If jojoba is ingested, toxicity will occur.

Teach Client/Family

- Caution the client not to consume any part of the jojoba plant. Toxicity will occur.

Juniper

(jew′nuh-puhr)

Scientific names: *Juniperus communis, Juniperus oxycedrus* L.

Other common names: A'ra'r a'di, ardic, baccal juniper, common juniper, dwarf, gemener, genievre, ground juniper, hackmatack, harvest, horse savin, juniper mistletoe, yoshu-nezu, zimbro

Origin: Juniper is an evergreen found in the United States, Canada, Europe, and Asia.

Uses

Traditionally, juniper has been used as a diuretic (for both adults and children) and an antiflatulent, as well as to treat urinary tract infections, diabetes mellitus, inflammation, gout, asthma, obesity, prostate disorders, and gastrointestinal disorders.

Actions

Juniper has been used for its hypoglycemic, antiinflammatory, and antimicrobial actions. However, few studies support these uses.

Hypoglycemic Action

In one study, juniper was given to both diabetic and nondiabetic laboratory animals. The dried berries were shown to reduce hyperglycemia in rats with streptozocin-induced diabetes (Sanchez de Medina et al, 1994; Swanston-Flatt et al, 1990).

Antiinflammatory Action

Juniper has been shown to inhibit prostaglandin synthesis and decrease platelet activating factor. It has been used in Sweden as an antiinflammatory (Tunon et al, 1995).

Antiinfective Action

One study (Cavaleiro et al, 2006) supports the antifungal activity against dermatophyte, aspergillus, and candida strains. There is a need for more research in this area.

Product Availability

Berry juice, capsules, essential oil, liquid, tablets

Plant Part Used: Dried fruit

Dosages

Diabetes Mellitus

- Adult PO capsules/tablets: 250-500 mg daily

Gastrointestinal Disorders

- Adult PO: 0.03-0.2 ml tid essential oil

Inflammation

- Adult PO: 0.2-0.3 mg/ml
- Adult topical: commonly used in bath salts for joint disorders

Urinary Tract Infection

- Adult PO: 20 mg/ml

Urinary Tract Infection

- Child PO berry juice: dilute in water

Contraindications

Class 2b herb (*Juniperus oxycedrus* L. fruit, berry).

Because it is an abortifacient, juniper should not be used during pregnancy. Until more research is available, this herb should not be used during breastfeeding. It should not be given to children younger than 2 years of age. Juniper should not be used by persons with hypersensitivity to it. Persons with diabetes mellitus and gastrointestinal disorders should use this herb with caution. Persons with urinary tract infections, kidney disease, or inflammation should use this herb only under the supervision of a qualified herbalist.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, diarrhea
GU: Increased diuresis
INTEG: Hypersensitivity reactions, skin irritation, burning, redness (topical)

Interactions

Drug

Antidiabetics: Juniper may increase the action of antidiabetics (theoretical).
Diuretics, minerals: Juniper may decrease the action of diuretics, mineral absorption (theoretical).
Lithium: Juniper taken with lithium may result in dehydration and lithium toxicity.

Continued

Interactions—cont'd

Lab Test

Urine assays: Juniper may interfere with urine assays.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Cresole Guaiacol		
Volatile oil	Piene; Sabinene; Mycrene; Limonene; Germacrene D; Gamma-Muurolene (Salido et al, 2002)	
Sesquiterpene	Cadinene	
Terpinen		Diuretic
Juniperin		
Resin		
Acid	Malic acid; Formic acid	
Protein		

Client Considerations

Assess

- Assess the reason the client is using juniper.
- Assess for hypersensitivity reactions, skin irritation, burning and redness. If present, discontinue the use of juniper and administer an antihistamine or other appropriate therapy.
- Assess for lithium use; juniper should not be used with lithium.

Administer

- Instruct the client to give juniper to children 2 years of age or older PO diluted in water. It should not be given to children younger than 2 years of age.
- Instruct the client not to use juniper for longer than 4 weeks. Renal damage may occur.

Teach Client/Family

- Caution the client not to use juniper during pregnancy because it is an abortifacient. Until more research is available, caution the client not to use this herb during breastfeeding. It should not be given to children younger than 2 years of age.

Kaolin

(kay′uh-luhn)

Scientific names: Kaolin, hydrated aluminum silicate

Origin: Kaolin is a naturally occurring clay that is treated for impurities.

Uses

Kaolin is often combined with pectin and used as an antidiarrheal.

Actions

Most of the information available on kaolin comes from the mainstream pharmacologic literature. Kaolin decreases both gastric motility and stool water content. It has adsorbent and demulcent properties.

Product Availability

Liquid

Dosages

Diarrhea

- Adult PO: 15-100 g q3hr (varies widely)

Radiation-induced Mucositis

- Adult topical: 1 ml (50% kaolin/pectin and 50% diphenhydramine) solution as a rinse qid (Jellin et al, 2008)

Contraindications

Until more research is available, kaolin should not be used during pregnancy and breastfeeding. It should not be given to children younger than 6 years of age. Kaolin should not be used by persons with hypersensitivity to this product.

Side Effects/Adverse Reactions

GI: Nausea, anorexia; constipation (chronic use)

Interactions

Drug

All medications: Kaolin decreases the absorption of all drugs; separate dosages by at least 2 hours.

Herb

All herbs: Kaolin decreases the absorption of all herbs; separate dosages by at least 2 hours.

Client Considerations

Assess

- Assess the reason the client is using kaolin.
- Assess the client's bowel pattern before administration of kaolin. Monitor for rebound constipation.
- Assess for dehydration in children.
- Assess for medications and herbs used. Separate dosages by at least 2 hours for proper absorption (see Interactions).

Administer

- Instruct the client not to use kaolin for more than 48 hours for diarrhea. If diarrhea is not relieved, a health care provider should be consulted.

Teach Client/Family

- Caution the client not to use kaolin in children younger than 6 years of age or those who are pregnant or breastfeeding until more research is available.

Karaya Gum

(kuh-ry′uh guhm)

Scientific names: *Sterculia urens, Sterculia* spp.

Other common names: Indian tragacanth, kadaya, kadira, katila, kullo, mucara, sterculia gum

Origin: Karaya gum is a tree found in India and Pakistan.

Uses

Karaya gum is used primarily as a bulk laxative. It is also used as an adhesive for colostomy appliances and dentures. Lozenges made from karaya gum are used to relieve sore throat. In addition, karaya gum is used as an emulsifier in foods.

Actions

Karaya gum has been used primarily as a bulk laxative. It swells in the bowel and decreases the transit time of intestine contents. Karaya gum has also been used as a protectant and adhesive for dentures and other appliances such as colostomy devices. Initial evidence indicates that karaya may decrease lipids and may also decrease blood glucose levels in diabetics. However, no studies confirm these actions at this time.

Product Availability

Powder

Plant Part Used: Dried sap

Dosages

No specified dosages are available. Products that include karaya gum identify the amount included.

Contraindications

Until more research is available, karaya gum should not be used during pregnancy and breastfeeding. It should not be given to children. Do not use karaya gum in bowel obstruction (Jellin et al, 2008).

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, abdominal pain, diarrhea, *gastrointestinal obstruction*

Interactions

Drug

All medications: Karaya gum causes decreased absorption of all drugs; separate dosages by at least 2 hours.

Herb

All herbs: Karaya gum causes decreased absorption of all herbs; separate dosages by at least 2 hours.

Pharmacology

Pharmacokinetics

Karaya gum is not absorbed and not digested.

Primary Chemical Component and Possible Actions

Chemical Class	Individual Component	Possible Action
Polysaccharide		

Client Considerations

Assess

- Assess the reason the client is using karaya gum.
- Assess the amount of bulk and water in the diet and the client's exercise habits if karaya gum is used as a bulk laxative.
- Assess for medications and herbs used. Separate dosages by at least 2 hours for proper absorption (see Interactions).

Administer

- Instruct the client to store karaya gum products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use karaya gum in children or those who are pregnant or breastfeeding until more research is available.

Kava

(kah'vah)

Scientific name: *Piper methysticum*

Other common names: Ava, awa, kava-kava, kawa, kew, sakau, tonga, yagona

Origin: Kava is a shrub found on the South Sea Islands.

Uses

Kava is used as an anxiolytic, antiepileptic, antidepressant, antipsychotic, and for anxiety, attention deficit–hyperactivity disorder, insomnia, restlessness, and headaches. It is also used as a muscle relaxant and to promote wound healing.

Investigational Use

Research is underway for use in cancer.

Actions

Kava acts as a sedative, an analgesic, and an anxiolytic. It has been used for ceremonial purposes in Micronesia and Polynesia for thousands of years in the place of alcoholic beverages, which have not always been available.

Sedative Action

The sedative action of kava is unlike any other. It appears to act directly on the limbic system. Kava lactones may actually modify receptor areas rather than bind to receptor binding sites (Holm et al, 1991).

Anxiolytic Action

There appears to be no lack of effectiveness, even at large doses over time. Several studies confirm the ability of kava to decrease anxiety. One study used 84 volunteers with anxiety conditions who received kavain, a kava lactone, in doses of 400 mg/day. In the experimental group, the result was an increase in memory and reaction time (Scholing et al, 1977). A more recent study showed a significant reduction of anxiety symptoms with the use of kava (Pittler et al, 2000). One group of volunteers was given 100 mg of kava extract three times daily, while the other received a placebo. After 4 weeks, when the subjects were evaluated using the Hamilton Anxiety Scale, the kava group reported a significant decrease in anxiety symptoms (Kinzler et al, 1991).

Analgesic, Antiinflammatory Action

The analgesic effect of kava appears to be unrelated to that of other pain relievers. Kava does not bind to opiate receptors and does not block pain impulses in the central nervous system. Its mechanism of action is unknown at present. One study (Folmer et al, 2006) identified kava as possessing TNF-alpha–induced activation of a nuclear factor. This information leads the researcher to believe that kava could be used for antiinflammatory conditions.

Product Availability

Capsules, beverage, extract, tablets, tincture

Plant Parts Used: Dried rhizome, dried roots

Dosages

Anxiolytic

- Adult PO extract, standardized: 45-70 mg kava lactones tid (Murray, Pizzorno, 1998)

Depression

- Adult PO extract, standardized: 45-70 mg kava lactones tid (Murray, Pizzorno, 1998)

General Use

- Adult PO extract, standardized: 70 mg kava lactones tid (Foster, 1998)
- Adult PO capsules/tablets: 400-500 mg up to 6 times/day (Foster, 1998)
- Adult PO tincture: 15-30 drops (dilution 1:2) taken tid in water (Foster, 1998)

Sedative

- Adult PO extract, standardized: 190-200 mg kava lactones 60 min at bedtime

Contraindications

Pregnancy category is 2; breastfeeding category is 3A.

Kava should not be given to children younger than 12 years of age. This herb should not be used by persons with major depressive disorder or Parkinson's disease, or by those with hypersensitivity to it.

Side Effects/Adverse Reactions

Most side effects and adverse reactions occur when high doses are taken for a long period.

CNS: Increased reflexes, drowsiness

EENT: Blurred vision, red eyes

GI: Nausea, vomiting, anorexia, weight loss, *hepatic damage*

Side Effects/Adverse Reactions—cont'd

GU: Hematuria
HEMA: Decreased platelets, lymphocytes, bilirubin, protein, and albumin; increased red blood cell volume
INTEG: Hypersensitivity reactions; skin yellowing and scaling (high doses)
RESP: Shortness of breath, *pulmonary hypertension*

Interactions

Drug

Antiparkinsonians *(carbidopa, levodopa):* Antiparkinsonian drugs may increase symptoms of parkinsonism when used with kava; do not use concurrently.
Antipsychotics *(chlorpromazine, fluphenazine, loxapine, mesoridazine, molindone, perphenazine, prochlorperazine, promazine, thioridazine, thiothixene, trifluoperazine, triflupromazine):* Antipsychotics taken with kava may result in neuroleptic movement disorders.
Barbiturates *(amobarbital, aprobarbital, butabarbital, phenobarbital, secobarbital):* Barbiturates taken with kava may result in increased sedation.
Benzodiazepines: Increased sedation and coma (theoretical) may result when kava is used with benzodiazepines, including alprazolam; do not use concurrently.
CNS depressants: CNS depressants such as alcohol, benzodiazepines, and barbiturates may cause increased sedation when used with kava; avoid concurrent use.
Cytochrome P450 1A2, 2C9, 2C19, 2D6, 3A4 substrates: Kava significantly decreases these substrates; use cautiously in patients taking these agents.

Food

Increased absorption of kava occurs when it is taken with food.

Lab Test

AST, ALT, LDH, bilirubin: Kava may increase hepatic function tests.

Pharmacology

Pharmacokinetics

Most pharmacokinetics and pharmacodynamics are unknown. Kava lactones are more readily absorbed orally when taken as an extract of the root than as kava lactones alone. Kava may cross the placenta and enter breast milk.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Components	Possible Action
Kava lactone	Kavain	Sedative; anxiolytic, P450 enzyme inhibition

Continued

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Components	Possible Action
	Marindinine; Methysticin; Dehydromethysticin; Yangonin; Desmethoxyyangonin; Epoxyyangonin (Matsuda et al, 2006)	
Chalcone **Kavain** **Dihydrokavain** **Pipermethystine**		
Bornyl esters	Cinnamic acid; Pinostrobin; Flavokawain B; Dimethoxyflavanone	COX-1, 2 inhibition (Wu et al, 2002)

Client Considerations

Assess

- Assess the reason the client is using kava.
- Assess for hypersensitivity reactions. If present, discontinue the use of kava and administer an antihistamine or other appropriate therapy.
- Assess for use of other central nervous system depressants, including alcohol, barbiturates, benzodiazepines, antianxiety medications, and sedatives/hypnotics (see Interactions).

Administer

- Instruct the client to store kava products in a cool, dry place, away from heat and moisture.
- Instruct the client not to use kava for longer than 3 months unless under the direction of an herbalist. This herb may be habit forming.
- Inform the client that kava absorption is increased when kava is taken with food.

Teach Client/Family

- Inform the client that pregnancy category is 2 and breastfeeding category is 3A.
- Caution the client not to give kava to children younger than 12 years of age.
- Inform the client that excessive doses may result in daytime drowsiness. Advise the client not to operate heavy machinery or engage in hazardous activities if drowsiness occurs.
- Caution the client not to use kava with other central nervous system depressants (see Interactions).

Kelp

(kehlp)

Scientific names: *Laminaria digitata, Laminaria japonica, Laminaria saccharina, Marcrocystis pyrifera*

Other common names: Brown algae, horsetail, sea girdles, seaweed, sugar wrack, tangleweed

Origin: Kelp is an algae found in the northern Atlantic and Pacific oceans.

Uses

Kelp has been used as an antiobesity and anticancer treatment and as an antihypertensive, antioxidant, abortifacient, and anticoagulant. It may be used for its high iodine content to treat goiter.

Actions

Cervical Dilatation

Laminaria has been used intravenously with prostaglandin E2 to terminate second-trimester pregnancies with fetal abnormalities. In one study, 106 pregnant women underwent insertion of a laminaria tent, followed by administration of prostaglandin E2 (Sulprostone IV) the following morning to induce uterine contractions. This is considered a satisfactory way to terminate second-trimester pregnancies (Chung et al, 1999). Another study found the use of laminaria to be a satisfactory means of dilating the cervix for various procedures (Mayr et al, 1998). There is growing concern that contamination may occur in some alga species and that kelp therefore should not be used for cervical tents. One study (Borgatta et al, 2005) identified that laminaria, when used with misoprostol and hypertonic saline, significantly prolongs induction time and increases narcotic analgesia use, when used for second-trimester abortion.

Product Availability

Capsules, extract, powder, tablets

Plant Part Used: Fronds

Dosages

- Adult PO capsules/tablets: 500-650 mg daily
- Adult *Laminaria* tent: insert to facilitate cervical dilation, before D&C

Contraindications

Because of its abortifacient properties, kelp should not be used during pregnancy. Until more research is available, kelp should not be used during breastfeeding. It should not be given to children. Kelp should not be used by persons with hypersensitivity to *Laminaria* spp. or those with hyperthyroidism.

Side Effects/Adverse Reactions

CV: Decreased blood pressure
GI: Nausea, vomiting, anorexia
HEMA: *Abnormal erythropoiesis, thrombocytopenia*
INTEG: Hypersensitivity reactions, acne-like eruptions
Reproductive: Uterine contractions, *abortion*
SYST: *Bleeding*

Continued

Interactions

Drug

Anticoagulants *(heparin, warfarin):* Use of kelp with anticoagulants may pose an increased risk of bleeding; avoid concurrent use.
Antihypertensives, ACE inhibitors: Antihypertensives may increase the hypotensive effects of kelp; avoid concurrent use.
Cardiac glycosides, potassium-sparing diuretics, potassium: Kelp with these agents may lead to hypokalemia.
Thyroid hormone replacement: Kelp may interfere with these agents.

Lab Test

Potassium, thyroid-stimulating hormone (TSH): Kelp may elevate potassium, TSH.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Components	Possible Action
Fucoidan **Glucan** **Polysaccharide**	Laminarin Algin	Cervical dilatation
Vitamin		
Iodine		
Minerals	Potassium	

Client Considerations

Assess

- Assess the reason the client is using kelp.
- Assess for hypersensitivity reactions. If present, discontinue the use of kelp and administer an antihistamine or other appropriate therapy.
- Assess for use of antihypertensives and anticoagulants (see Interactions). Monitor blood pressure.
- Assess blood work, including complete blood count and platelets; watch for bruising, black tarry stools, or frank blood.

Administer

- Instruct the client to store kelp products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use kelp during pregnancy because of its abortifacient properties. Until more research is available, caution the client not to use kelp during breastfeeding and not to give it to children.
- Advise the client not to use kelp tents to increase dilatation during labor. Use of kelp tents may cause contamination leading to infection and toxic shock syndrome.

= Pregnancy = Pediatric = Alert = Popular Herb

Kelpware

(kelp'wehr)

Scientific name: *Fucus vesiculosus*

Other common names: Black-tang, bladder fucus, bladder-wrack, blasen-tang, quercus marina, sea wrack, sea-oak, seetang

Origin: Kelpware is a seaweed found in the Atlantic and Pacific oceans.

Uses

In traditional herbal medicine, kelpware has been used to treat obesity and menorrhagia, to increase iodine levels in goiter, and to reduce inflammation of the renal system.

Investigational Uses

In preliminary research, kelpware has shown promise as an anticoagulant, antioxidant, and antimicrobial.

Actions

Anticoagulant Action

Kelpware has been shown to exert significant anticoagulant action. One study showed that activated partial thromboplastin time was prolonged in vitro (Durig et al, 1997).

Antimicrobial, Antioxidant Action

Kelpware has shown antimicrobial activity against *Escherichia coli, Neisseria meningitidis, Candida guilliermondii,* and *Candida krusei* (Craido et al, 1984). One study identified the antioxidant properties of kelpware (Ruperez et al, 2002).

Product Availability

Fluid extract, gel tabs, soft extract, tablets, whole plant (dried)

Plant Part Used: Whole plant

Dosages

- Adult PO bruised plant: put 16 g herb in 500 ml water, take 2 oz tid-qid
- Adult PO fluid extract: 4-8 ml before meals
- Adult PO gel tabs/tablets: 3 tabs daily, then gradually increase to 24 daily
- Adult PO soft extract: 200-600 mg daily

Contraindications

Until more research is available, kelpware should not be used during pregnancy and breastfeeding. It should not be given to children. Kelpware should not be used by persons with cardiac disorders such as recent myocardial infarction, congestive heart failure, or severe angina pectoris. It also should not be used by the elderly or persons who have cancer, thyroid disorders (except goiter), renal/hepatic disease, diabetes mellitus, or hypersensitivity to this herb.

Side Effects/Adverse Reactions

ENDO: Hyperglycemia
GI: Nausea, vomiting, anorexia, increased hunger
GU: Increased urinary output, *nephrotoxicity*
INTEG: Hypersensitivity reactions

Continued

Interactions

Drug

***Anticoagulants** (heparin, warfarin):* Use of kelpware with anticoagulants may pose an increased risk of bleeding; avoid concurrent use.

Diuretics: Kelpware may decrease the action of diuretics.

Thyroid hormones: Kelpware may decrease the effects of thyroid hormones; avoid concurrent use.

Food

Iron: Kelpware may reduce iron absorption.

Lab Test

Activated partial thromboplastin time (aPTT), thyroid-stimulating hormone (TSH) T_4: Kelpware may increase these tests.

Radioactive iodine uptake: Kelpware may interfere with this test.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Polysaccharide	Algin; Fucoidan	Bulk laxative Anticoagulant
Vitamin		
Iodine		
Mineral	Bromine; Cadmium; Lead	

Client Considerations

Assess

- Assess the reason the client is using kelpware.
- Assess for hypersensitivity reactions. If present, discontinue the use of kelpware and administer an antihistamine or other appropriate therapy.
- Assess for anticoagulant and thyroid hormone therapy (see Interactions).
- Assess blood work, including CBC and platelets. Watch for bruising, black tarry stools, and frank blood.
- Assess for symptoms of nephrotoxicity (increased BUN and creatinine levels), which may result from heavy metal contaminants in kelpware.

Administer

- Instruct the client to store kelpware products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use kelpware in children or those who are pregnant or breastfeeding until more research is available.
- Advise the client to not confuse bladderwort with this agent.

Khat ⚠

(kaht)

Scientific name: *Catha edulis*

Other common names: Cat, chat, gad, kaht, kat, miraa, tschut

Origin: Khat is a tree found in Africa and on the Arabian Peninsula.

Uses

Khat has been used in traditional herbal medicine to treat fatigue, obesity, depression, and peptic ulcer.

Actions

Analgesic Action

In a comparative study of khat, amphetamines, and ibuprofen performed to identify pain-reducing qualities, all three were found to reduce pain (Connor et al, 2000).

Stimulant Action

Khat has been evaluated for its amphetamine-like action, which results from one of its alkaloid chemical components, cathinone (Ahmed et al, 1993; Kalix, 1996). Khat has been shown to be teratogenic and embryotoxic in rats (Islam et al, 1994). Another study (Banjaw et al, 2006a) identified that repeated dosing with khat led to increased aggression in male rats. Khat is similar to amphetamine and is considered to be a psychostimulant (Banjaw et al, 2006b).

Antiinflammatory Action

One study used the flavonoid fraction of khat to evaluate its antiinflammatory action in rats with carrageenan-induced paw edema and paw granuloma. Administration of khat produced a significant antiinflammatory action, comparable to that of oxyphenbutazone (Al-Meshal et al, 1986).

Product Availability

Raw leaves

Plant Part Used: Raw leaves

Dosages

- Adult PO raw leaves: 100-200 g chewed, followed by fluids

Contraindications

Until more research is available, khat should not be used during pregnancy and breastfeeding. It should not be given to children. Persons with hypersensitivity to khat should not use it, and those with renal/cardiac/hepatic disease should avoid its use.

Side Effects/Adverse Reactions

CNS: Restlessness, insomnia, headache, psychosis, hallucinations, decreased reaction time, hyperthermia, sweating

CV: Increased heart rate, arrhythmias, increased blood pressure, *pulmonary edema, circulatory collapse, death*

GI: Nausea, vomiting, anorexia, constipation, abdominal pain, stomatitis, *hepatotoxicity,* abdominal spasms

Continued

Side Effects/Adverse Reactions—cont'd

GU: Decreased sperm count, decreased libido
INTEG: Hypersensitivity reactions
SYST: *Cerebral hemorrhage*

Interactions

Drug

Amphetamines, antiarrhythmics, antihistamines, antihypertensives, beta-blockers, calcium channel blockers, cardiac glycosides, decongestants, and MAOIs: Khat may increase the action of these agents.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid	Cathine	Increased adrenocortical function
	Cathinone	Amphetamine-like; increased adrenocortical function
	Eduline; Ephidrine; Cathinine; Cathidine	
Tannin		
Phenylpentenylamine		
Phenylpropyl		

Client Considerations

Assess

- Assess the reason the client is using khat.
- Assess for hypersensitivity reactions. If present, discontinue the use of khat and administer an antihistamine or other appropriate therapy.
- Assess for use of other medications, including antihypertensives, cardiac glycosides, beta-blockers, antiarrhythmics, calcium channel blockers, amphetamines, antihistamines, and decongestants (see Interactions).
- Monitor hepatic function tests periodically (AST, ALT, and bilirubin levels); if elevated, discontinue use of khat.

Administer

- Instruct the client to store khat products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use khat in children or those who are pregnant or breastfeeding until more research is available.
- Warn the client of the life-threatening side effects of khat.

Khella

(keh'luh)

Scientific name: *Ammi visnaga*

Other common names: Ammi, bishop's weed, khellin, visnagin

Origin: Khella is found in Egypt and Pakistan.

Uses

Traditionally, khella has been used in combination with other herbs to treat angina pectoris. It has also been used to relieve abdominal cramping, dysmenorrhea, and biliary colic.

Investigational Uses

Researchers are working to determine whether khella is useful for the reduction of cholesterol levels, the prevention of bronchial asthma, and the treatment of atherosclerosis and severe allergic reactions.

Actions

Among the possible actions of khella are antidiabetes effects, calcium channel blocking effects, and alteration of high-density lipoproteins (HDLs). No conclusions can be drawn from research. However, khella may dilate coronary vessels and bronchioles.

Antidiabetic Actions

An extensive survey was taken of 130 participants who had agreed to provide information about plant-based hypoglycemic treatments used in Israel. *Ammi visnaga* L. was among the plants listed (Yaniv et al, 1987). Another study in the laboratory, showed significant hypoglycemic effects when an aqueous extract of khella was used in rats (Jouad et al, 2002).

Calcium Channel Blocking Action

In a study that screened medicinal plants for their calcium-antagonistic action, one of the furanochromones present in khella, visnagin, was shown to inhibit potassium spasms. This inhibitory action results in a vasodilator response, suggesting that khella exerts a calcium-antagonistic effect (Rauwald et al, 1994).

Alteration of High-Density Lipoproteins

In a study focusing on the HDL-increasing effect of khella, participants with normal weight and normal lipid levels were given khellin, one of the furochromones present in *Ammi visnaga.* The participants received 50 mg four times daily for 4 weeks, and their lipid levels measured each week. Total cholesterol and triglyceride levels remained unchanged, although HDL levels increased and low-density lipoprotein (LDL)/HDL ratios decreased (Harvengt et al, 1983).

Product Availability

Capsules, dried powdered root extract, tablets, tea

Plant Parts Used Fruit, roots, seeds

Dosages

Angina

- Adult PO dried powdered root extract: 100 mg tid (12% khellin) (Murray, Pizzorno, 1998)

Contraindications

Because it is a uterine stimulant, khella should not be used during pregnancy. Until more research is available, this herb should not be used during breastfeeding and it should not be given to children. Persons with hypersensitivity to khella should not use it, and persons with hepatic disease, severe cardiac disorders, bleeding disorders, or hypotension should avoid its use. It is now considered a disapproved herb, because there are many potential risks.

Side Effects/Adverse Reactions

CNS: Insomnia, dizziness, headache
GI: Nausea, vomiting, anorexia, constipation, elevated hepatic function tests
INTEG: Hypersensitivity reactions, phototoxicity; skin cancer (topical use)

Interactions

Drug

Anticoagulants *(aspirin, heparin, warfarin):* Khella increases the risk of bleeding when used with anticoagulants such as heparin, warfarin, and aspirin; avoid concurrent use.
Antihypertensives, calcium channel blockers, diuretics: Increased hypotension is possible when khella is used with antihypertensives, calcium channel blockers, diuretics; avoid concurrent use.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Visnagin		Calcium channel blocker
Khellin		Anticholesterol
Furanochromone		
Flavonoid	Quercetin; Kaempferol Isorhamnetin	Antiinflammatory
Essential oil	Camphor; Terpineol; Terpinen; Linalool	
Psoralen	Methoxypsoralen	
Protein		

Client Considerations

Assess

- Assess the reason the client is using khella.
- Assess for hypersensitivity reactions. If present, discontinue the use of khella and administer an antihistamine or other appropriate therapy.
- Monitor hepatic function tests, including AST, ALT, and bilirubin, at least every 6 weeks.
- Assess for use of anticoagulants, salicylates, antihypertensives, calcium channel blockers, and diuretics (see Interactions).

Administer

- Instruct the client to store khella products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use khella in children or those who are pregnant or breastfeeding until more research is available.
- Advise the client not to perform hazardous activities such as driving or operating heavy machinery until physical response to the herb can be evaluated. Dizziness can occur.

Kudzu

(kuhd'zew)

Scientific name: *Pueraria lobata*

Other common names: Japanese arrowroot, kudzu vine, ge gen

Origin: Kudzu is a vine found in China and Japan.

Uses

Traditionally, kudzu has been used for the suppression of alcoholism and as a treatment for arrhythmias, muscular aches and pains, and measles.

Actions

Suppression of Alcoholism

Kudzu has been used in traditional herbal medicine to suppress alcoholism. Research shows the presence of reversible inhibitors of an enzyme needed to metabolize alcohol in humans (Keung, 1993). One study showed that kudzu decreased alcoholism in hamsters. Researchers identified the hamsters' baseline water and ethanol intake and then administered kudzu. The volume of ethanol intake decreased by approximately 50%. After the kudzu was stopped, alcohol intake returned to pretreatment levels (Keung et al, 1993). Daidzin and daidzein, two of the chemical components of kudzu, were identified as being responsible for the suppression of alcoholism (Keung et al, 1998).

Cardiovascular Action

Kudzu has been shown to increase cerebral blood flow and decrease myocardial oxygen consumption in patients with diagnosed arteriosclerosis. Kudzu has been used successfully to treat cardiovascular disorders such as hypertension, angina, and cardiac ischemia (Qicheng, 1980).

Other Actions

Some of the other proposed actions of kudzu include antipyretic and contraceptive effects. This herb may also be useful for the reduction of muscle pain. More research is needed to determine the validity of these claims. Another claim is the use of kudzu for hangovers. However, there is an increase in acetaldehyde-associated neoplasm risk (McGregor et al, 2007).

Product Availability

Capsules, extract, tablets, powder

Plant Parts Used: Root, flowers

Dosages

- Adult PO decoction: cut root into 0.4-0.7 cm slices, place in water 12-15 times the weight of the root; decoct 30 min
- Adult PO root tablet: 120 mg depending on brand
- Adult PO root extract: 150-300 mg tid or 300 mg daily

Contraindications

Class 1 herb (root).

Until more research is available, kudzu should not be used during pregnancy and breastfeeding. It should not be given to children. Kudzu should not be used by persons with hypersensitivity to it and should be used cautiously by persons who have heart disease.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia

INTEG: Hypersensitivity reactions

Interactions

Drug

Antiarrhythmics, cardiac glycosides: Kudzu may enhance their effects.

Anticoagulant, antiplatelets: Kudzu may increase bleeding risks when taken with these agents (Jellin et al, 2008).

Estrogens, hormonal contraceptives: Kudzu may increase the action of these agents.

Herb

Estrogenic herbs *(alfalfa, black cohosh, flaxseed, licorice, red clover, soy):* These herbs may increase the action of kudzu.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Glycoside	Kudzusaponins A1, A2, Ar, SA4, SB1	
Sterol		
Isoflavone	Daidzin; Daidzein; Puerarin; Rutin; Furylfuramide;	Alcoholism suppression; antioxidant; antimutagenic
		Estrogenic, antiestrogenic
	Puerarin	Decreases HR, renin activity, platelet aggregation

Client Considerations

Assess

- Assess the reason the client is using kudzu.
- Assess for hypersensitivity reactions. If present, discontinue the use of kudzu and administer an antihistamine or other appropriate therapy.

- Assess cardiac status, including rate, rhythm, and character. Identify cardiac conditions and cardiac medications used (see Interactions).

Administer

- Instruct the client to store kudzu products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use kudzu in children or those who are pregnant or breastfeeding until more research is available.

https://t.me/ALGRAWANY

Lady's Mantle

(lay'deez man'tuhl)

Scientific names: *Alchemilla vulgaris, Alchemilla mollis*

Other common names: Alchemilla, Bear's foot, dewcup, leontopodium, lion's foot, nine hooks, stellaria

Origin: Lady's mantle is a flowering plant found in Europe, the United States, and Canada.

Uses

Traditional uses of lady's mantle include control of bleeding (when used topically), treatment of menorrhagia, and relief of menstrual cramps, menopausal symptoms, and diarrhea. It is also used as an astringent and to heal wounds.

Actions

Lady's mantle is used primarily for its astringent and antidiarrheal effects. Its astringent effects are responsible for its ability to both lessen bleeding and decrease diarrhea. The high tannin content (pedunculagin and alchemillin) is probably responsible for the wound-healing properties (Shirivasteva et al, 2007) and astringent effects of this herb. The tannins may also inhibit the enzyme elastase, and the flavonoid components of lady's mantle have been shown to inhibit two other enzymes, trypsin and chymotrypsin. These enzyme inhibitory effects may protect elastic tissues.

Product Availability

Extract, tea, tablets, tincture, ointment

Plant Parts Used: Flowers, leaves, root

Dosages

- Adult PO extract: 2-4 ml tid
- Adult PO herb: 5-10 g daily (Blumenthal, 1998)
- Adult PO tea: pour boiling water over 2 tsp herb, let steep 15 min, take tid
- Adult PO tincture: 5 drops taken in water q 30-60 min
- Adult topical ointment: apply to affected area as needed daily

Contraindications

Class 1 herb (whole herb).

Because it may cause uterine contractions, lady's mantle should not be used during pregnancy. Until more research is available, this herb should not be used during breastfeeding and should not be given to children. Persons with hypersensitivity to this herb should not use it.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, *hepatic damage*

INTEG: Hypersensitivity reactions

Interactions

Drug

Iron salts: Lady's mantle tea may decrease the absorption of iron salts; separate by 2 hours.

Lab Test

AST, ALT: Lady's mantle may increase AST, ALT.

= Pregnancy = Pediatric = Alert = Popular Herb

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Elligitannin		
Flavonoid	Quercetin	Antiinflammatory
Tannin	Pedunculagin; Alchemillin	Wound healing; astringent

Client Considerations

Assess

- Assess the reason the client is using lady's mantle.
- Assess for hypersensitivity reactions. If present, discontinue the use of lady's mantle and administer an antihistamine or other appropriate therapy.
- Assess for hepatic damage including increased hepatic function tests.

Administer

- Instruct the client to store lady's mantle products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use lady's mantle during pregnancy because it may cause uterine contractions. Until more research is available, caution the client not to use this herb during breastfeeding and not to give it to children.

L

Lavender

(la'vuhn-duhr)

Scientific names: *Lavandula officinalis, Lavandula latifolia, Lavandula angustifolia, Lavandula stoechas*

Other common names: Aspic, echter lavendel, English lavender, esplieg, French lavender, garden lavender, lavanda, lavande commun, lavandin, nardo, Spanish lavender, spigo, spike lavender, true lavender

Origin: Lavender is a flowering shrub found in the Mediterranean.

Uses

Lavender traditionally has been used as a sedative, an anxiolytic, and to relieve insomnia. It has also been used to increase appetite and to treat cuts, abrasions, and various conditions of the nervous system. It is a common aromatherapeutic agent and is a component in many cosmetic products such as shampoos, conditioners, lotions, and soaps.

Investigational Uses

Initial research studies are available documenting the use of lavender to treat cancer. Lavender may be used to produce diuresis.

Actions

It is thought that lavender, when inhaled, acts directly on the olfactory nerve in the brain, producing a sedative effect (Lin et al, 2007; Yamada et al, 2005). Its antitumor effects may be due to perillyl alcohol and limonene, two chemical components

of the herb (Mills, Bone, 2000). Several studies have documented the use of lavender for the treatment of different types of cancer (breast, pancreatic, ovarian, liver, breast, and prostate) (Bronfen et al, 1994; Gould, 1995; Haag, Gould, 1994; Stark et al, 1995). These studies show varying results, but all indicate disease stabilization or tumor regression. The anticancer action of lavender may be due to its ability to produce redifferentiation in cancer cells (Shi, Gould, 1995). The diuretic activity of lavender was studied in rats. There was an increase in diuresis that may be attributed to specific chemical components (Elhajili et al, 2001). Lavender may be effective against *Giardia duodenalis, Trichomonas vaginalis,* and *Hexamita inflata* (Moon et al, 2006).

Product Availability

Candles, flowers, oil, tincture, spirits; component of lotions, soaps, shampoos, and conditioners

Plant Part Used: Flowers

Dosages

Standardized forms are not available.

- Adult PO oil: place 2-4 drops on a sugar cube
- Adult PO tea: place 1-2 tsp flowers in 1 cup boiling water (Blumenthal, 1998), steep 10-15 min
- Adult PO tincture (1:5): take up to 2 ml tid
- Adult topical: place 1-2 cups flowers in teapot, heat to boiling, strain, add to bath water (Blumenthal, 1998)

Contraindications

Pregnancy category is 3; breastfeeding category is 2A.
Lavender may be given to children. Persons with hypersensitivity to lavender should not use it.

Side Effects/Adverse Reactions

CNS: Headache, drowsiness, dizziness, euphoria, *central nervous system depression*
GI: Nausea, vomiting, increased appetite, constipation
INTEG: Hypersensitivity reactions, contact dermatitis

Interactions

Drug

CNS depressants *(alcohol, antihistamines, opioids, and sedative/hypnotics):* These agents may increase sedation when used with lavender; avoid concurrent use.
HMG-CoA reductase inhibitors: Lavender may decrease the action of these agents.
Iron salts: Lavender tea may decrease the absorption of iron salts; separate by 2 hours.

Lab Test

Cholesterol: Lavender can reduce cholesterol test levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil	Linalool; Limonene; Perillyl alcohol	Sedative, hypotensive Antitumor
	Linalyl acetate; Cis-ocimene; Beta-caryophyllene; Terpinene	
Coumarin	Umbelliferone Herniarin	
Caffeic acid (derivative)		Bile stimulant
Tannin		Wound healing; astringent

Client Considerations

Assess

- Assess the reason the client is using lavender.
- Assess for hypersensitivity reactions such as contact dermatitis. If present, discontinue the use of lavender and administer an antihistamine or other appropriate therapy.
- Assess the client's use of alcohol, antihistamines, opioids, and sedative/hypnotics (see Interactions).

Administer

- Instruct the client to store lavender products in a cool, dry place, away from heat and moisture.
- Lavender oil should be taken internally only under the supervision of a qualified herbalist.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 2A.

Lecithin

(leh'suh-thuhn)

Scientific name: 1,2,diacyl-sn-glycero-3-phosphatidycholine

Other common names: Granulestin, kelecin, lecithol, vitellin

Origin: Lecithin is found in foods such as eggs, beef liver, and peanuts. Commercial sources are available.

Uses

Lecithin is used to treat hepatic diseases, including hepatitis, cirrhosis, and liver damage; treat diseases of the central nervous system such as Alzheimer's disease, bipolar disorder and myasthenia gravis; reduce cholesterol levels; limit tardive dyskinesia; boost the immune system; and prevent the formation of gallstones. It is also

used as an emulsifier in food, cosmetics, and other pharmaceutical products. Lecithin may be used to maintain choline concentration in marathon runners.

Actions

Lecithin is found in food such as meat products, fruits, and vegetables. The best sources are oranges, beef liver, eggs, and some nuts. Lecithin reduces high cholesterol levels, improves memory and liver function, and decreases tardive dyskinesia. One of its chemical components, phosphatidylcholine, is also present in *S*-adenosyl-L-methionine, commonly known as SAM-e, a supplement used to treat depression.

Antihypercholesteremic Action

Both the antihypercholesterolemic effect of lecithin and its ability to prevent atherosclerosis are believed to result from its ability to increase the metabolism of cholesterol in the gastrointestinal system. In one study in which 21 hyperlipidemic clients were given soybeans for 4 months, cholesterol, triglycerides, and total serum lipids were reduced by a statistically significant amount (Saba et al, 1978). In contrast, many earlier studies showed inconclusive results.

Memory Improvement

Lecithin has been shown to increase acetylcholine at receptor sites in the neurologic system, improving memory. One of the chemical components of lecithin, phosphatidylcholine, is a precursor to acetylcholine. One study demonstrated that memory improved significantly after 4 to 6 weeks of lecithin administration (Murray, 1996).

Other Actions

Phosphatidylcholine is used in Germany to treat cirrhosis of the liver, hepatitis, and toxic liver. One study using baboons showed that lecithin exerted a hepatoprotective effect against cirrhosis when the study animals were fed alcohol along with phosphatidylcholine (Murray, 1996). Lecithin has also been shown to increase immunity and dissolve gallstones.

Product Availability

Capsules, tablets

Dosages

Alzheimer's Disease

- Adult PO capsules/tablets: 100 mg tid (as phosphatidylcholine) (Murray, Pizzorno, 1998); 20-45 g daily (Jellin et al, 2008)

Bipolar Disorder

- Adult PO capsules/tablets: 15-30 g (as phosphatidylcholine) (Murray, Pizzorno, 1998)

Gallstone Prevention

- Adult PO capsules/tablets: 100 mg tid (Murray, Pizzorno, 1998)

Reduction of cholesterol

- Adult PO capsules/tablets: 20-30 g daily (Jellin et al, 2008)

Contraindications

Until more research is available, lecithin should not be used therapeutically during pregnancy and breastfeeding. It should not be given therapeutically to children.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, gastrointestinal upset, *hepatitis*

Interactions

Lab Test

Cholesterol: Lecithin may decrease cholesterol results.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Phosphatide	Phosphatidylcholine	Antidepressant; improved cognition
	Phosphatidyl ethanolamine; Phosphatidyl serine; Phosphatidyl inositol	
Fatty acid	Palmitic acid; Oleic acid; Stearic acid	
Carbohydrate		

Client Considerations

Assess

- Assess the reason the client is using lecithin.
- Assess for symptoms of hepatitis (jaundice, clay-colored stools). If present, discontinue the use of lecithin.
- Monitor hepatic function tests (AST, ALT, and bilirubin) if the client is taking lecithin long term. If results are elevated, discontinue the use of lecithin.

Administer

- Instruct the client to store lecithin products in a sealed container away from heat and moisture.

Teach Client/Family

- Caution the client not to use lecithin therapeutically in children or those who are pregnant or breastfeeding until more research is available.

Lemon Balm

(leh′muhn bawlm)

Scientific name: *Melissa officinalis* L.

Other common names: Balm, cure-all, dropsy plant, honey plant, Melissa, sweet balm, sweet Mary

Origin: Lemon balm is a perennial found in the Mediterranean, Asia, Europe, and North America.

Uses

Lemon balm traditionally has been used orally to treat insomnia, anxiety, gastric conditions, migraines, hypertension, bronchial conditions, Graves' disease, attention deficit disorder, and psychiatric conditions including depression and hysteria. Lemon balm has also been used topically to treat cold sores.

Actions

Lemon balm has been studied for its antimicrobial, antiviral, and sedative actions and also as a treatment for colitis. Multiple studies are not yet available to confirm any of these proposed actions.

Antimicrobial Actions

One study evaluating the antimicrobial effect of lemon balm found that *Melissa officinalis* exhibited a relatively higher degree of activity against bacteria, fungi, and yeasts than did *Lavandula officinalis* (lavender) (Larrondo et al, 1995). Another study (Canadovic-Brunet et al, 2008) identified lemon balm as a radical scavenging and antibacterial herb.

Antiviral Action

Researchers have evaluated the virucidal and antiviral effects of *M. officinalis* with respect to herpes simplex virus type 1. The virucidal effect was found to occur within 3 to 6 hours of treatment (Dimitrova et al, 1993).

Sedative Action

The sedative action of lemon balm was identified when the hydroalcoholic extract of *M. officinalis* was given to mice. With high doses, the sedative effect was confirmed by a reduction in acetic acid-induced pain and induced sleep in the mice (Kennedy et al, 2002; Soulimani et al, 1991).

Colitis Treatment

Lemon balm was evaluated in combination with *Taraxacum officinale, Hipericum perforatum, Calendula officinalis,* and *Foeniculum vulgare* for the treatment of chronic nonspecific colitis (Chakurski et al, 1981). Results indicated that all 24 patients in the study experienced the disappearance of pain in the large intestine.

Product Availability

Comminuted herb, concentrated extract, cream, dry extract, fluid extract, herb powder

Plant Parts Used: Dried leaves, fresh leaves, whole plant

Dosages

Canker Sores, Herpes Simplex Type 1, Mouth Ulcers

- Adult topical concentrated extract: apply prn (dilution of 70:1)
- Adult topical cream: apply bid (Murray, Pizzorno, 1998)
- Adult topical poultice: apply prn

Other

- Adult PO infusion: pour boiling water over 1.5-4.5 g herb, let set 10 min, strain; usual dose is 8-10 g/day (Blumenthal, 1998)

Alzheimer's Disease (mild to moderate)

- Adult PO standardized extract (1:1): 60 drops/day (Jellin et al, 2008)

Insomnia

- Adult PO extract: 80 mg with valerian extract 120 mg tid × ≤30 days (Jellin et al, 2008)

Contraindications

Pregnancy category is 3; breastfeeding category is 2A.

Lemon balm may be given to children. This herb should not be used by persons with hypothyroidism or by those who are hypersensitive to it.

Side Effects/Adverse Reactions

GI: Nausea, anorexia
INTEG: Hypersensitivity reactions

Interactions

Drug

Barbiturates *(amobarbital, aprobarbital, butabarbital, phenobarbital, secobarbital),* ***CNS depressants*** *(including alcohol):* Lemon balm may potentiate the sedative effects of barbiturates, CNS depressants.
Iron salts: Lemon balm tea may decrease the absorption of iron salts; separate by 2 hours.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil	Geranial; Neral; Citronellal; Linalool; Geraniol; Geranylactetate	Diaphoretic, sedative
	Citral	Estrogenic
Glycoside	Eugenol	Antioxidant
Flavonoid	Cynaroside; Rhamnocitrin; Isoquercitrin; Cosmosiin; Luteolin, Apigonin	
Triterpene acid	Caffeic acid; Ferulic acid Rosmarinic acid	Bile stimulant Antimicrobial
Tannins		

Client Considerations

Assess

- Assess the reason the client is using lemon balm.
- Assess for hypersensitivity reactions. If present, discontinue the use of lemon balm and administer an antihistamine or other appropriate therapy.
- Assess the client's use of barbiturates, other central nervous system depressants and iron salts (see Interactions).

Administer

- Instruct the client to store lemon balm products in a sealed container, away from heat and moisture. Products may be kept for up to 1 year.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 2A.
- Inform the client that lemon balm may be given to children.

Lemongrass

(leh'muhn-gras)

Scientific name: *Cymbopogon citratus*

Other common names: Capim-cidrao, Guatemala lemongrass, Madagascar lemongrass

Origin: Lemongrass is a perennial grass found in Central America, South America, the West Indies, and the tropics of Asia.

Uses

Lemongrass has been used in traditional herbal medicine to treat anxiety, insomnia, gastrointestinal complaints, vomiting, hypertension, and fever. It is also used as an antitussive, antiseptic, and antirheumatic.

Investigational Uses

The antibacterial, antifungal, analgesic, and anticholesteremic properties of lemongrass are under investigation.

Actions

Studies done on lemongrass have focused on its antibacterial, antifungal, analgesic, and anticholesteremic actions. Multiple studies are not yet available to confirm any of the proposed actions.

Antibacterial and Antifungal Actions

Lemongrass has been shown to inhibit gram-positive cocci and rods, gram-negative rods, and 12 types of fungi (Pattnaik et al, 1996). One study confirmed the bacteriocidal effect of lemongrass on *Escherichia coli* (Pattnaik et al, 1995b), while a similar study showed a resistance to *Pseudomonas aeruginosa* when combined with lemongrass (Pattnaik et al, 1995a). A more recent study found that lemongrass was effective against *Plasmodium bergher* (Tchoumbougnang et al, 2005).

Analgesic Action

One study that tested lemongrass for its analgesic effect supports its use in folk medicine as a sedative. When rats were given an infusion of lemongrass, a dose-dependent analgesia occurred (Lorenzetti et al, 1991; Viana et al, 2000).

Anticholesteremic and Antidiabetic Action

During a study in which lemongrass was given to 22 hypercholesteremic subjects, serum cholesterol decreased in amounts that approached clinical significance. However, 90 days after completion of the study, cholesterol levels were found to have not remained at the decreased level (Elson et al, 1989). One study confirms the folkloric use of lemongrass in type 2 diabetes (Adeneye et al, 2007).

Product Availability

Tea

Plant Part Used: Leaves

Dosages

- Adult PO tea: lemongrass tea may be made from fresh or dried leaves; 1-2 tsp in boiling water

Contraindications
Class 2b herb (whole herb).
No absolute contraindications have been identified.

Side Effects/Adverse Reactions
GI: Dry mouth
INTEG: Contact dermatitis

Interactions
Lab Test
Amylase, bilirubin: Lemongrass may elevate these test results.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Essential oil	Myrcene	Analgesic
	Geraniol; Limonene; Alpha-pinene; Alpha-terpineole	Antimicrobial
	Citral	Central nervous system depressant
Diterpene		
Aldehyde		
Alcohol		
Saponin		

Client Considerations
Assess
- Assess the reason the client is using lemongrass.

Administer
- Instruct the client to store lemongrass products in a cool, dry place, away from heat and moisture.

Teach Client/Family
- Advise the client that lemongrass has no known toxicity or side effects.

Lentinan
(lehnt′nehn)

Scientific names: *Lentinula edodes, Lentinus edodes*

Other common names: Forest mushroom, hua gu, pasania fungus, shiitake mushroom, snake butter

Origin: Lentinan is found in the shiitake mushroom, which is found in Japan and China.

Uses

Lentinan is used as an immune regulator and to treat bacterial and viral infections and cancer.

Investigational Uses

Lentinan has been used in treatment of digestive, breast, and prostate cancer and HIV/AIDS.

Actions

Antibacterial and Antiviral Actions

Initial research is available that documents the antibacterial action of lentinan. Lentinan has been shown to be effective against *Streptococcus* sp., *Actinomyces* sp., *Lactobacillus* sp., *Prevotella* sp., and *Porphyromonas* sp., and to promote resistance to *Staphylococcus* sp., *Escherichia* sp., *Bacillus* sp., *Candida* sp., and *Enterococcus* sp. (Hirasawa et al, 1999). Another study showed that lentinan exerts significant antiviral action against the Western equine encephalitis virus in mice (Takehara et al, 1979).

Antihypertensive Action

An early study indicated that lentinan decreases hypertension in hypertensive rats. Investigators fed mice a diet of 5% mushroom powder and 0.5% NaCl (sodium chloride) solution as drinking water for 9 weeks. At the end of the study, blood pressure and plasma-free cholesterol were reduced (Kabir et al, 1987).

Hemagglutinin Action

A study (Tsivileva et al, 2000) has identified the hemagglutinating activity (HA) of *Lentinus edodes.* One morphogenetic structure of the mushroom was shown to possess significant hemagglutinating activity.

Other Actions

A study has shown a rebalance of cell-mediated immunity in digestive cancers with use of lentinan (Yoshino et al, 2000). However, lentinan may cause a worsening of ulcerative colitis as studied in rats (Mitamura et al, 2000). Another study (Gu et al, 2005) found that lentinan significantly reduced cell proliferation in carcinoma cells.

Product Availability

Whole mushroom

Plant Part Used: Fruiting body

Dosages

- Adult injection: 1-4 mg/wk may be used (Jellin et al, 2008)

Contraindications

Until more research is available, consumption of lentinan (shiitake mushrooms) is not recommended during pregnancy and breastfeeding. It should not be given to children. Persons with hypersensitivity to shiitake mushrooms should not consume them. Shiitake mushrooms have been shown to promote severe respiratory, immunologic, and dermatologic reactions (Nakamura, 1992; Sastre, 1990; Van Loon et al, 1992); however, most of the available studies have focused on farmers who grow shiitake mushrooms or workers who handle them.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions, contact dermatitis, *toxicodermia*
SYST: *Respiratory and immunologic reactions in persons working with mushrooms*

Interactions

Drug

Didanosine (ddI, Videx): Lentinan used with didanosine may increase CD4 counts (Jellin et al, 2008).

Lab Test

CD4 counts: Lentinan IV with didanosine may increase CD4 counts in HIV patients (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Mannitol Polysaccharide		Diuretic

L

Client Considerations

Assess

- Assess the reason the client is using lentinan.
- Assess for hypersensitivity reactions, contact dermatitis, and toxicodermia. If present, discontinue the consumption of shiitake mushrooms and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store shiitake mushrooms in a cool, dry place, away from moisture and heat.

Teach Client/Family

- Caution the client not to give shiitake mushrooms to children or consume mushrooms during pregnancy or breastfeeding until more research is available.

Licorice

(li′kuh-rish)

Scientific name: *Glycyrrhiza glabra*

Other common names: Chinese licorice, licorice root, Persian licorice, Russian licorice, Spanish licorice, sweet root

Origin: Licorice is a shrub found in subtropical climates.

Uses

Licorice has been used as a laxative and as a treatment for asthma, malaria, hepatitis, abdominal pain, gastric disorders, dry cough, systemic lupus erythematosus (SLE), bacterial/viral infection, eczema, chronic fatigue syndrome, and sleeplessness. It has also been used as a flavoring, coloring agent, and a component in shampoos.

Investigational Uses

Studies are underway to investigate the estrogenic, antiinflammatory, antiviral (HIV/AIDS), antibacterial, and pseudoaldosterone actions of licorice, most of which result from the chemical components glycyrrhizin and glycyrrhetinic acid.

Actions

Traditionally, licorice has been used as an expectorant, an antitussive, and a laxative. More recently, studies have begun to focus on its antiinfective, estrogenic, antiinflammatory, and pseudoaldosterone effects.

Antiinfective Action

One study has shown that glycyrrhizin and glycyrrhetinic acid are able to stimulate interferon, which in turn is able to block DNA replication in viruses (Abe et al, 1982). This action has definite applications for HIV/AIDS patients. Another study focused on 16 hemophilic patients with HIV infection. These patients were given 150 to 225 mg of glycyrrhizin for 3 to 7 years. While immune system results were monitored, none of the patients showed progression of the infection (Ikegami et al, 1993). Two other studies have reported similar results (Hattori et al, 1989; Mori et al, 1989). Glycyrrhiza has also been shown effective against *Staphylococcus aureus, Streptococcus mutans, Mycobacterium,* and *Candida albicans* (Mitscher et al, 1980).

Estrogenic Action

Glycyrrhizin has been shown to exert estrogenic activity. It is responsible for both increasing estrogen levels that are too low and decreasing those that are too high. It is thought that the isoflavone (saponin) content is responsible.

Antiinflammatory Action

Glycyrrhizin and glycyrrhetinic acid are able to bind to glucocorticoid receptors, thus decreasing the inflammatory response. Research has also demonstrated that many enzymes related to the inflammatory response are decreased as well (Kumagai et al, 1967).

Pseudoaldosterone Action

Pseudoaldosterone syndrome has been induced when large amounts of glycyrrhiza were taken, resulting in increased blood pressure, electrolyte imbalances, and decreased aldosterone levels. Glycyrrhiza may be helpful in the treatment of Addison's disease.

Other Actions

Glycyrrhetinic acid has been proven useful in the treatment of peptic ulcer, duodenal ulcer, and apthous ulcer disease. Topical application of glycyrrhetinic acid has been shown to be effective against skin disorders such as psoriasis, eczema, and herpes simplex. One study (Sheela et al, 2006) showed that licorice may be a potential supplement for cancer therapy.

Product Availability

Candy, capsules, chewable tablets, deglycyrrhizinated licorice (DGL), fluid extract, gum, smoking products, solid extract, tablets, tea, tincture

Plant Parts Used: Rhizome, roots

Dosages

Asthma

- Adult PO fluid extract (1:1): 2-6 ml (1:1 dilution) daily (Murray, Pizzorno, 1998)
- Adult PO powdered root: 1-2 g tid (Murray, Pizzorno, 1998)
- Adult PO solid extract (dry powdered): 250-500 mg (4:1 dilution) tid (Murray, Pizzorno, 1998)

Chronic Fatigue Syndrome

- Adult PO fluid extract: 2-4 ml (1:1 dilution) (Murray, Pizzorno, 1998)
- Adult PO powdered root: 1-2 g tid (Murray, Pizzorno, 1998)
- Adult PO solid extract (dry powdered): 250-500 mg (4:1 dilution) tid (Murray, Pizzorno, 1998)

Gastric Disorders

- Adult PO capsules: 200-600 mg/day standardized to glycyrrhizin, taken <6 wk; 400-500 mg up to 6×/day (Foster, 1998)
- Adult PO DGL: 6-8 250 mg chewable tablets/day (McCaleb et al, 2000), taken between meals or 20 min before meals
- Adult PO fluid extract: 2-4 ml (1:1 dilution) tid
- Adult PO powdered root: 1 g up to tid (McCaleb et al, 2000)
- Adult PO solid extract (dry powder): 250-500 mg (4:1 concentration) tid
- Adult PO tea: place 1 tsp crude herb in 4 oz boiling water, simmer at least 5 min, strain; tea may be taken tid after meals
- Adult PO tincture: 20-30 drops up to tid (Foster, 1998)

Hepatitis

- Adult PO fluid extract: 2-4 ml (1:1 dilution) tid (Murray, Pizzorno, 1998)
- Adult PO powdered root: 1-2 g tid (Murray, Pizzorno, 1998)
- Adult PO solid extract (dry powdered): 250-500 mg tid (Murray, Pizzorno, 1998)

HIV/AIDS

- Adult PO fluid extract: 2-4 ml (1:1 dilution) tid (Murray, Pizzorno, 1998)
- Adult PO solid extract (dry powdered): 250-500 mg tid (5% glycyrrhetinic acid) (Murray, Pizzorno, 1998)

Menopause

- Adult PO fluid extract: 4 ml (1 tsp) (1:1 dilution) tid (Murray, Pizzorno, 1998)
- Adult PO powdered root: 1-2 g tid (Murray, Pizzorno, 1998)
- Adult PO solid extract (dry powdered): 250-500 mg (4:1 dilution) (Murray, Pizzorno, 1998)

Peptic Ulcer Disease, Acute

- Adult PO chewable tablets: 2-4 tablets (190-380 mg) 20 min before meals (Murray, Pizzorno, 1998)

Peptic Ulcer Disease, Maintenance

- Adult PO chewable tablets: 1-2 tablets 20 min before meals (Murray, Pizzorno, 1998)

Contraindications

Pregnancy category is 1; breastfeeding category is 2A.
Licorice may be given to children in moderate amounts. It should not be used by persons with hepatic renal disease, hypokalemia, hypertension, arrhythmias, congestive heart failure, or those with hypersensitivity to it.

Side Effects/Adverse Reactions

CNS: Headache, weakness
CV: Hypertension, edema, *arrest*
ENDO: *Hypokalemia*
GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions

Interactions

Drug

Antiarrhythmics, corticosteroids *(betamethasone, dexamethasone, hydrocortisone, methylprednisolone, prednisone, triamcinolone):* Licorice may increase corticosteroids and the cardiac effects of antiarrhythmics; do not use concurrently.
Antihypertensives: Use of licorice with antihypertensives may cause increased hypokalemia; do not use concurrently.
Azole antifungals: Licorice may increase the levels of azole antifungals; avoid concurrent use.
Cardiac glycosides *(digoxin):* Use of licorice with cardiac glycosides may cause increased toxicity and increased hypokalemia; do not use concurrently.
Cytochrome P450 3A4, 2B6 substrates: Licorice may decrease the action of these agents.
Diuretics *(amiloride, triamterene):* Use of licorice with diuretics may cause increased hypokalemia; avoid concurrent use.

Herb

Aloe *(taken internally),* ***buckthorn, cascara, Chinese rhubarb:*** Licorice may cause hypokalemia when used with stimulant laxative herbs (aloe [taken internally], buckthorn, cascara, and Chinese rhubarb); avoid concurrent use.

Food

Grapefruit juice: Use of licorice with grapefruit juice may increase corticosteroid action of licorice.

Lab Test

Anion gap, blood, potassium, serum prolactin, serum or urine sodium: Licorice may decrease anion gap, blood; potassium (greater than 6 weeks); serum prolactin; serum or urine sodium results.
Serum, urine myoglobin: Licorice may cause a possible positive test for serum, urine myoglobin.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Saponin	Glycyrrhizin; Glycyrrhetinic acid	Estrogenic; antiinflammatory; antiviral; antibacterial; pseudoaldosterone
Flavonoid	Licoagrodione Liquiritigenin; Isoliquiritigenin; Isolicoflavonol	Antimicrobial
Isoflavonoid	Formononetin; Glabren; Glabridin; Glabrol; Hydroxyglabrol; Glycyrrhisoflavone; Isoflavonol; Kumatakenin; Licoricone; Glabrizoflavone, Pinocernbrin; Galangin	
Coumarin	Herniarin; Umbelliferone; Glycocoumarin; Licopyranocoumarin	
Sterol	Stigmasterol; Beta-sitosterol	

Client Considerations

Assess

- Assess the reason the client is using licorice.
- Assess for hypersensitivity reactions. If present, discontinue the use of licorice and administer an antihistamine or other appropriate therapy.
- Assess medications and herbs the client may be taking, including cardiac glycosides, antihypertensives, antiarrhythmics, and corticosteroids (see Interactions).

Administer

- Instruct the client to store licorice products in a cool, dry place, away from heat and moisture.
- Instruct the client not to use licorice for longer than 6 weeks.

Teach Client/Family

- Inform the client that pregnancy category is 1 and breastfeeding category is 2A.
- Teach the client that licorice may be used in children in moderate amounts.
- Advise the client to increase potassium intake if using licorice for extended periods.

Lily of the Valley

(li-lee)

Scientific name: *Convallaria majalis*

Other common names: Jacob's ladder, ladder-to-heaven, lily constancy, lily convalle, male lily, May lily, muguet, our-lady's-tears

Origin: Lily of the valley is a perennial found in the United States, Canada, and Europe.

Uses

Lily of the valley has been used as an anticonvulsant, a cardiotonic, and to treat heart disease. Topically, it has been used to treat burns.

Actions

The cardiac glycoside action of lily of the valley is due to the chemical components convallatoxol, convallarinycoside, convallotoxin, convallamarin, locundjosid, and convallosid. These chemical components are less toxic than those of foxglove, which has been used as a source for digitalis (McGuigan, 1984). Several other actions have been proposed, but to date none is supported by research. Among these proposed actions are hypoglycemic, emetic, and diuretic effects. Convallamarosides, one of the chemical components of lily of the valley, showed significant inhibition of the number of new vessels induced in mice tumor cells (Nartowska et al, 2004).

Product Availability

Extract, powder, capsules, drops

Plant Parts Used: Flowers, leaves, roots

Dosages

- Adult PO standardized powder: 0.6 g (Blumenthal, 1998)

Contraindications

Class 3 herb (whole plant).

Until more research is available, lily of the valley should not be used during pregnancy and breastfeeding. It should not be given to children. Persons with cardiac conditions such as heart failure and arrhythmias should not use this herb. The FDA considers lily of the valley an unsafe herb; therefore it is not recommended for use.

Side Effects/Adverse Reactions

CNS: Headache, dizziness, psychosis, *paralysis, coma*
CV: *Arrhythmias, heart failure, death*
EENT: Dilated pupils
GI: Nausea, vomiting, anorexia, abdominal pain, diarrhea, increased salivation
INTEG: Hypersensitivity reactions, clammy skin, dermatitis
MISC: Hyperkalemia, urinary urgency

Interactions

Drug

Antibiotics, macrolide, tetracyclines: Lily of the valley with these agents may lead to cardiac glycoside toxicity.

Continued

Interactions—cont'd

Beta-blockers, calcium channel blockers, cardiac glycosides: Lily of the valley used with beta-blockers or calcium channel blockers increases the risk of bradycardia; do not use concurrently. Lily of the valley may increase the effects of digoxin; do not use concurrently.

***Diuretics** (potassium-depleting):* Lily of the valley with these agents may lead to hypokalemia.

Herb

Buckthorn, cascara: Hypokalemia can result from the use of buckthorn or cascara with lily of the valley; avoid concurrent use.

Hawthorn: Hawthorn increases the action of lily of the valley when taken concurrently.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Glycoside	Convallatoxol; Convallarinycoside; Convallotoxin; Convallamarin; Locundjosid; Convallosid	Cardiac glycoside
	Convallasaponin A (Higano et al, 2007)	
Saponin	Convallamaroside	Steroidal
Volatile oil		
Asparagin		
Rutin		Antioxidant
Resin		

L

Client Considerations

Assess

- Assess the reason the client is using lily of the valley.
- Assess for hypersensitivity reactions and dermatitis. If present, discontinue the use of lily of the valley and administer an antihistamine or other appropriate therapy.
- Assess for medications and herbs used (see Interactions).
- Assess whether the client is using this herb under the supervision of a qualified herbalist. Lily of the valley is potentially deadly.
- Assess for cardiac conditions such as heart failure and arrhythmias. Because research information is lacking, clients with these conditions should not use lily of the valley.

Administer

- Instruct the client to store lily of the valley in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use lily of the valley in children or those who are pregnant or breastfeeding until more research is available.
- Warn the client that the FDA considers lily of the valley unsafe. Advise the client to use this herb only under the supervision of a qualified herbalist.

Lobelia

(loe-beel'yuh)

Scientific name: *Lobelia inflata*

Other common names: Asthma weed, bladderpod, cardinal flower, emetic herb, gagroot, great lobelia, Indian pink, Indian tobacco, pukeweed, rapuntium inflatum, vomitroot, vomitwort

Origin: Lobelia is found in wooded areas of the United States and Canada.

Uses

Lobelia traditionally has been used to treat asthma, bronchitis, cough, and pneumonia, usually as an expectorant.

Investigational Uses

Researchers are studying lobelia for its cardiac effects and its antispasmodic effects in the gastrointestinal system. Its use as a smoking deterrent and treatment for psychostimulant abuse is also under investigation.

Actions

Lobelia is often used in combination with *Capsicum frutescens* (capsicum) and *Symphlocarpus factida* (skunk cabbage). Studies have focused on its use as a smoking deterrent and its emetic, cardiac, and expectorant properties.

Smoking Deterrent

Three of the chemical components of lobelia, lobeline, lobelanine, and lobelanidine, have properties similar to those of nicotine but generally are considered less potent. However, toxicity is higher with lobelia than with other traditional smoking deterrents currently on the market, such as nicotine transdermal systems (e.g., Nicoderm and Habitrol). The chemical components of lobelia inhibit smoking by first stimulating nicotine receptors and then inhibiting them.

Emetic Action

The emetic action of lobelia results from stimulation of the chemoreceptor trigger zone. This action is similar to that of other emetics that are available. Lobelia also activates the vagal and afferent neural pathways responsible for vomiting.

Cardiovascular Action

Lobelia's cardiac action results from both positive inotropic and chronotropic effects. Blood pressure and the neurotransmitters epinephrine and norepinephrine are increased in a manner similar to that seen with nicotine usage.

Expectorant Action

Lobelia is considered to be a very effective expectorant and has been used to treat respiratory conditions for many years. It causes bronchodilation.

Other Actions

Lobelia inflata was found to functionally antagonize the neurochemical and behavioral effects of the psychostimulants amphetamine and methamphetamine (Dwoskin et al, 2002; Neugebauer et al, 2007).

Product Availability

Capsules, fluid extract, lozenges, tablets, tincture; available in combination with cayenne pepper *(Capsicum frutescens)* and lungwort *(Pulmonaria officinalis)*

Plant Part Used: Dried leaves

Dosages

Smoking Deterrent

- Adult PO tablets: the usual dosage is 2 mg taken with 4 oz water after meals for 6 wk

Other

- Adult PO dried herb: 0.2-0.6 g tid
- Adult PO fluid extract: 8-10 drops tid (Pizzorno, Murray, 2006)
- Adult PO tincture: 15-30 drops tid

Expectorant

- Adult PO: 100 mg leaf or 0.6-2 ml tincture (Jellin et al, 2008)

Contraindications

Class 2b herb.

Until more research is available, lobelia should not be used during pregnancy and breastfeeding. It should not be given to children in large doses as an emetic. Lobelia should not be used by geriatric clients, or by persons with hepatic/renal disorders, pneumonia, nicotine sensitivity, or hypersensitivity to it. It should not be used by people who have cardiovascular disorders such as congestive heart failure, cardiac decompensation, sinus arrhythmias, valvular dysfunction, bundle branch block, or hypertension. Toxicity can result from the use of lobelia.

Side Effects/Adverse Reactions

CNS: Tremors, dizziness, headache, anxiety, insomnia, *seizures*
CV: Palpitations, *hypotension or hypertension*
GI: Nausea, vomiting, anorexia, pain in abdomen, heartburn
INTEG: Hypersensitivity reactions
RESP: Cough, *respiratory depression or stimulation*
Toxicity: *Seizures, nausea, vomiting, increased salivation, diarrhea, mental confusion, weakness, change in vision and hearing, respiratory depression, arrhythmias, tremors, hypothermia, coma, death*

Interactions

Drug

Nicotine: Lobelia increases the effects of nicotine-containing products; do not use concurrently.

Herb

Mayapple: Lobelia may decrease the laxative effect of mayapple.

Pharmacology

Pharmacokinetics

Chemical components of lobelia may cross the placenta and enter the breast milk. Components are metabolized by the liver and lung and excreted via the kidneys. Lobelia is well absorbed by the mouth and lungs across dermal barrier.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid	Lobeline	Nicotine-like, respiratory stimulant
	Lobelanine; Lobelanidine	Emetic, respiratory stimulant
	Lobelane	Inhibits amphetamine-induced dopamine (Dwoskin et al, 2002)

Client Considerations

Assess

- Assess the reason the client is using lobelia.
- Assess for hypersensitivity reactions. If present, discontinue the use of lobelia and administer an antihistamine or other appropriate therapy.
- Assess for symptoms of toxicity: seizures, nausea, vomiting, increased salivation, diarrhea, mental confusion, weakness, change in vision and hearing, respiratory depression, arrhythmias, tremors, hypothermia, and coma.
- Assess for the use of nicotine-containing products and mayapple (see Interactions).

Administer

- Instruct the client to store lobelia products in a cool, dry place, away from heat and moisture.
- Instruct the client to use lobelia for no more than 6 weeks for smoking cessation.
- Administer atropine 2 mg subcut for acute toxicity.

Teach Client/Family

- Caution the client not to give lobelia to children in large doses as an emetic, and not to use in those who are pregnant or breastfeeding until more research is available.
- Warn the client to stop smoking before using lobelia as a smoking deterrent. Nicotine toxicity can occur.

Lovage

(luh′vij)

Scientific names: *Levisticum officinale, Levisticum radix*

Other common names: Maggi plant, sea parsley, smellage

Origin: Lovage is a perennial found in Europe, the United States, and Canada.

= Pregnancy = Pediatric = Alert = Popular Herb

Uses

Lovage has been used as a diuretic, an antilithic, a renal antiinflammatory, a sedative, and to treat renal disorders, gastric conditions, and respiratory congestion.

Actions

One study (Schinkovitz et al, 2008) identified the antimycobacterial effects of lovage. Few well-controlled studies have been carried out on lovage, and at present, none of its uses or actions can be confirmed. For this reason, use of lovage cannot be recommended.

Product Availability

Essential oil, tea

Plant Parts Used: Roots, seeds

Dosages

- Adult PO tea: place 1.5-3 g finely cut root in 8 oz boiling water, let stand 15 min, strain; up to 8 g herb/day may be used

Contraindications

Class 2b herb (root).

Until more research is available, lovage should not be used during pregnancy and breastfeeding. It should not be given to children. Lovage should not be used by persons with renal disease or irritation of the kidneys, or those who are hypersensitive to it.

Side Effects/Adverse Reactions

GI: Nausea, anorexia

INTEG: Hypersensitivity reactions, photodermatitis

Interactions

Drug

Anticoagulants *(heparin, warfarin)*, ***salicylates:*** Lovage may increase the effects of anticoagulants (heparin, warfarin) and salicylates; avoid concurrent use.

Diuretics: Lovage may increase sodium retention.

Primary Chemical Components and Possible Actions*

Chemical Class	Individual Component	Possible Action
Volatile oil	Ligusticumlactone Butylphthalide; Citronellal	Antispasmodic
Lactone	Phthalide	
Coumarin		
Furocoumarin	Bergaptene; Apterin	
Hydroxycoumarin	Umbelliferone	
Polyyne	Falcarindiol	
Terpenoid		
Volatile acid		

*Investigation of the chemical components of this herb is not complete.

Client Considerations

Assess

- Assess the reason the client is using lovage.
- Assess for hypersensitivity reactions, photodermatitis. If present, discontinue the use of lovage and administer an antihistamine or other appropriate therapy.
- Assess for edema in the feet. If the client is using lovage to treat this condition, advise to use other proven treatments.
- Monitor BUN, creatinine, potassium, sodium, and chloride levels during lovage therapy. If results are elevated, use of lovage should be discontinued.
- Assess the client's use of anticoagulants, which should not be used concurrently with lovage (see Interactions).

Administer

- Instruct the client to store lovage products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Advise the client not to use lovage in children or those who are pregnant or breast-feeding until more research is available.

Lungwort

(luhng wawrt)

Scientific name: *Pulmonaria officinalis*

Other common names: Dage of Jerusalem, Jerusalem cowslip, Jerusalem sage, lung moss, lungs of oak, spotted comfrey

Origin: Lungwort is found in many parts of Europe.

Uses

Traditionally, lungwort has been used to treat respiratory conditions including bronchitis, congestion, and cough. It has also been used to treat diarrhea and menstrual irregularities and may be used topically as a compress to promote wound healing. Lungwort possesses antiinflammatory actions.

Investigational Uses

Lungwort has been investigated for use as an anticoagulant.

Actions

Research on any of the uses or actions of lungwort is lacking. To date, no controlled studies have been done on either laboratory animals or humans. The only studies available focus on the chemical composition of lungwort; therefore this herb should be used under the supervision of a qualified herbalist only. The tannins are probably responsible for the wound healing properties; the glycopeptides, for the anticoagulant effect (Leven et al, 1992); and allantoin, for the emollient effect.

Product Availability

Extract, tablets, tincture, juice, drops, syrup

Plant Part Used: Leaves

Dosages

- Adult PO infusion: place 1-2 tsp dried leaves in 8 oz boiling water, let stand 10 min, take tid; alternatively, add 1 g finely cut herb to 8 oz cold water, boil rapidly 5-10 min, strain
- Adult PO tincture: 1-4 ml tid

Contraindications

Class 1 herb.

Until more research is available, lungwort should not be used during pregnancy and breastfeeding. It should not be given to children. Lungwort should not be used by persons with hypersensitivity to it.

Side Effects/Adverse Reactions

GI: Nausea, anorexia, irritation

INTEG: Hypersensitivity reactions, contact dermatitis

SYST: Increased bleeding time

Interactions

Drug

Anticoagulants *(heparin, warfarin)*, ***salicylates:*** Lungwort may increase the effects of anticoagulants (heparin, warfarin) and salicylates; avoid concurrent use.

Lab Test

PT, INR: Lungwort increases PT and INR.

L

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Allantoin		Emollient
Flavonoid	Quercetin; Kaempferol	Antiinflammatory, astringent
Tannin		Wound healing
Anticoagulant	Glycopeptide	Anticoagulant
Vitamin	C	
Saponin		
Caffeic acid (derivative)	Chlorogenic acid; Rosmarinic acid	
Mucilage	Polygalacturonane; Arabinogalactans; Rhamnogalacturonane	Antitussive

Client Considerations

Assess

- Assess the reason the client is using lungwort.
- Assess for hypersensitivity reactions and contact dermatitis. If present, discontinue the use of lungwort and administer an antihistamine or other appropriate therapy.

- Assess for bleeding. Monitor anticoagulant studies (PT, INR) (see Interactions).
- Assess the client's respiratory status, including rate, character, cough, and congestion.

Administer

- Instruct the client to store lungwort products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use lungwort in children or those who are pregnant or breastfeeding until more research is available.
- Caution the client not to confuse *Pulmonaria officinalis* with *Pulmonaria mollis.*
- Advise the client to inform all health care providers of lungwort use.

Lycopene

(like′uh-peen)

Scientific name: psi-carotene

Origin: Lycopene is a carotenoid that occurs naturally in tomatoes.

Uses

Lycopene is used as an antioxidant and may protect against cancer of the prostate, pancreas, and stomach.

Actions

Lycopene naturally occurs in tomatoes. Processing tomatoes increases the lycopene content. One study of 19 human subjects evaluated lipid peroxidation and LDL oxidation. Lycopene supplementation resulted in a reduction of lipids and LDLs and therefore may decrease the risk of coronary heart disease (Agarwal et al, 1998). Another study showed that lycopene exerts a protective effect against myocardial infarction (Kohlmeier et al, 1997) and decreased inflammation in colitis (Reifen et al, 2001). Doxorubicin cardiotoxicity was reduced when used with lycopene when studied in the lab on animals (Anjos Ferreira et al, 2007). In the lab, prostatic cancer cells were treated with various concentrations of lycopene. There was a decrease in prostate cancer cells, which may lead to successful drug treatment in prostate cancer using lycopene (Kanagaraj et al, 2007; Graydon et al, 2007).

Product Availability

Capsules, tablets

Dosages

Prostate Cancer

- Adult PO: 15 mg bid (Jellin et al, 2008)

Contraindications

Until more research is available, lycopene supplements should not be used during pregnancy and breastfeeding. They should not be given to children. Lycopene supplements should not be used by persons with hypersensitivity to this product.

Side Effects/Adverse Reactions

GI: Nausea, anorexia

Interactions

Lab Test

Prostate specific antigen (PSA): Lycopene may decrease PSA in prostate cancer.

Pharmacology

Pharmacokinetics

The bioavailability is significantly higher when synthetic lycopene is in oil (Tang et al, 2005).

Client Considerations

Assess

- Assess for adequate lycopene in the diet (tomatoes, processed tomato products).

Administer

- Instruct the client to store lycopene products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use lycopene supplements in children or those who are pregnant or breastfeeding until more research is available.

Lysine

(lise′een)

Scientific name: 2,6-diaminohexanoic acid

Origin: Lysine is an amino acid manufactured by the body. It also can be found in dairy products, brewer's yeast, meats, and wheat germ.

Uses

Lysine has been used to treat cold sores and other herpes infections, including genital herpes. It has also been used with some success to treat Bell's palsy and rheumatoid arthritis and to detoxify opiates.

Actions

Several reports have shown that lysine improves herpes infections. One study evaluated 1543 participants by questionnaire. More than 80% of those who responded stated that lysine supplements lessened the severity of genital herpes lesions, canker sores, and cold sores (Walsh et al, 1983). Another study evaluating 45 patients taking lysine daily in various doses found a shortened duration of herpes infections and decreased recurrence. The result occurs when the lysine-to-arginine ratio increases (Griffith et al, 1978). Other studies have refuted these claims, with research showing no reduction in herpes infections (Milman et al, 1978; Simon et al, 1985).

Product Availability

Capsules, tablets

Dosages

PO dosages as high as 4000 mg/day have been reported.

Recurrent Herpes Simplex Labialis Infections

- Adult PO: 1000 mg daily × 1 year, then 1000 mg tid × 6 months (Jellin et al, 2008)

Contraindications

Until more research is available, lysine supplements should not be used during pregnancy and breastfeeding. They should not be given to children. Lysine supplements should not be used by persons with hypersensitivity to this product.

Side Effects/Adverse Reactions

GI: Nausea, anorexia, diarrhea, abdominal pain

Interactions

Drug

Aminoglycosides: Use of large amounts of lysine causes increased aminoglycoside toxicity; avoid concurrent use.

Calcium: Lysine increases calcium absorption, decreases urine calcium loss.

Pharmacology

Pharmacokinetics

Lysine is an amino acid that is naturally present in the body. Its pharmacokinetics and pharmacodynamics are unknown.

Client Considerations

Assess

- Assess for aminoglycoside, calcium use. Advise the client to avoid concurrent use with lysine (see Interactions).

Administer

- Instruct the client to store lysine products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use lysine supplements in children or those who are pregnant or breastfeeding until more research is available.

Maitake

(mah-ee-tah'keh)

Scientific name: *Grifola frondosa*

Other common names: Dancing mushroom, king of mushrooms, monkey's bench, shelf fungi

Origin: Maitake is a mushroom found in Japan.

Uses

Maitake has been used to treat hypertension, diabetes mellitus, cancer, high cholesterol, and obesity.

Actions

Maitake, along with other mushrooms, has been used for thousands of years in Asia for a variety of purposes. It is considered a "miracle herb" by many in the Orient.

Anticancer Action

Maitake is an immune modulator, helping to normalize the immune system. It exerts its anticancer action by activating interleukin-1 and increasing T-cells, both of which inhibit the proliferation of cancers (Adachi et al, 1987). Multiple studies have identified the cancer-fighting properties of maitake. Besides activating interleukin-1 and increasing T-cells, maitake also increases cytokine production and boosts the action of macrophages. Most studies have identified its anticancer properties as resulting from the polysaccharide beta-glucan.

Antiobesity Action

Although its mechanism of action is unclear, maitake is responsible for weight loss when taken over an extended period of time. In one study, 30 overweight clients were given maitake powder for 2 months. The clients lost between 7 and 26 pounds when taking various dosages ranging from 20 to 500 mg daily (Yokota, 1992). Another study using laboratory animals showed weight loss after 4½ months. The amount of weight lost was significant when compared with that of the control group (Ohtsuru, 1992).

Other Actions

One study has shown that the use of maitake reduces blood pressure and cholesterol and improves diabetes. After hypertensive laboratory animals were fed maitake powder, their blood pressure was evaluated and a small reduction was noted (Kabir et al, 1989). Other researchers found that maitake inhibits lipid metabolism. Rats given maitake showed a reduction in serum lipids, total cholesterol, and very-low-density lipoprotein (VLDL) (Fukushima et al, 2001; Kabir et al, 1987; Kubo et al, 1996, 1997). The antidiabetes action of maitake is believed to result from its ability to reduce insulin resistance and possibly increase sensitivity to insulin (Horio et al, 2001; Lo et al, 2008). Other studies (Kodama et al, 2008; Wang et al, 2008) identify the immunity against foreign pathogens without eliciting adverse inflammatory response. One novel study (Gu et al, 2007) identified an anti-HSV-1 protein from maitake. Therefore maitake may possess antiviral activity.

Product Availability

Capsules, extract

Plant Parts Used: Mushroom, whole fungus

Dosages

- Adult PO: 250-500 mg daily

Contraindications

Class 1 herb (fruiting body, mycelium).

Until more information is available, maitake should not be used during pregnancy and breastfeeding. It should not be given to children. Maitake should not be used by persons with hypersensitivity to it.

Side Effects/Adverse Reactions

ENDO: Hypoglycemia

Interactions

Drug

Antidiabetics: Maitake may increase the action of antidiabetics.

Immunosuppressants *(azathioprine, basiliximab, daclizumab, muromonab, mycophenolate, tacrolimus):* Maitake may decrease the effects of immunosuppressants; do not use immediately before, during, or after transplant surgery.

Herb

Hypoglycemic herbs: Maitake may increase the hypoglycemic effect of these herbs.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Polysaccharide	Beta-glucan	Antitumor

Client Considerations

Assess

- Assess the reason the client is using maitake.
- Assess for medications used; do not use with immunosuppressants; monitor closely with antidiabetics (see Interactions).

Administer

- Instruct the client to store maitake products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use maitake in children or those who are pregnant or breastfeeding until more research is available.

Male Fern

(mayl fuhrn)

Scientific name: *Dryopteris filix-mas*

Other common names: Bear's paw, erkek egrelti, helecho macho, knotty brake, marginal shield-fern, shield fern, sweet brake, wurmfarn

Origin: Male fern is a perennial fern found in Asia, Europe, Africa, South America, the United States, and Canada.

= Pregnancy = Pediatric = Alert = Popular Herb

Uses

Male fern has been used primarily as an anthelmintic against pork, beef, and fish tapeworm. It is used topically for arthritis, neuralgia, and earache.

Actions

The anthelmintic activity of male fern against tapeworms is well documented. This herb is thought to produce fewer side effects than do products containing quinacrine. Male fern should be considered if traditional treatments do not result in complete expulsion of the worms. However, consideration must also be given to the toxicity of this herb, including hepatotoxicity, even though it produces fewer side effects than products with quinacrine. Clients with cardiac, renal, or hepatic disease should not use male fern.

Product Availability

Capsules, draught, extract

Plant Parts Used: Dried rhizomes, roots

Dosages

Male fern is seldom used today because it is highly toxic.

- Adult PO extract: 3-6 ml
- Child PO extract: age 4-12 years: 0.25-0.5 ml/year of age, not to exceed 4 ml in divided doses

Male fern is typically given with a saline laxative to aid in expulsion of worms.

NOTE: Allow 1 week between doses.

Contraindications

Because it is an abortifacient, male fern should not be used during pregnancy. Until more research is available, this herb should not be used during breast-feeding and should not be given to infants. Persons with cardiovascular disease, hepatic/renal disease, and gastric or duodenal ulcers should not use this herb. Male fern should not be used by persons with hypersensitivity to it. Use only PO under the supervision of a qualified herbalist. Male fern is highly toxic.

Side Effects/Adverse Reactions

CNS: Headache

GI: Nausea, vomiting, anorexia, diarrhea, severe abdominal pain and cramping, *hepatotoxicity*

MISC: Albuminuria, shortness of breath, hyperbilirubinemia

Toxicity: *Seizures, heart failure, respiratory failure, permanent blindness, coma, death*

Interactions

Drug

Antacids, H_2-blockers, proton pump inhibitors: These agents may decrease the action of male fern; separate by at least 2 hours.

HMG-CoA reductase inhibitors: Male fern taken concurrently with these agents may cause hepatotoxicity; do not use together.

Continued

Interactions—cont'd

Herb

Castor: Do not use male fern with castor oil; increased toxicity may occur (Jellin et al, 2008).

Food

Fats, oil, alcohol: Male fern with these products leads to increased absorption and adverse reactions.

Lab Test

Hepatic function tests: Male fern increases hepatic function tests.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Phloroglucinol		
Filicic acid		Anthelmintic
Flavaspidic acid		Anthelmintic
Volatile oil		
Tannin		Wound healing; astringent
Albaspidin		
Desaspidin		

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of male fern and administer an antihistamine or other appropriate therapy.
- Assess for cardiovascular, renal, and hepatic disease. Clients with these conditions should not use male fern.
- Monitor hepatic function tests (ALT, AST, bilirubin). Watch for hepatotoxicity.
- Watch for signs of toxicity: seizures, heart failure, blindness, respiratory failure, and coma. Death can occur.

Administer

- Instruct the client to use male fern only PO and only under the supervision of a qualified herbalist because it is considered a high-risk herb.
- Instruct the client as follows: the night before treatment, eat only a light meal or no meal, followed by a laxative. The next morning, take male fern with another laxative before breakfast.

Teach Client/Family

- Caution the client not to use male fern during pregnancy because it is an abortifacient. Until more research is available, caution the client not to use this herb during breastfeeding and do not give it to infants.

Mallow

(ma'loe)

Scientific name: *Malva sylvestris*

Other common names: Blue mallow, cheeseflower, cheeseweed, field mallow, fleurs de mauve, high mallow, malve, zigbli

Origin: Mallow is found in subtropical and temperate climates.

Uses

Mallow has been used to treat respiratory conditions such as cough (antitussive, demulcent), tonsillitis, sore throat, bronchitis, and irritation of the respiratory tract. It has also been used to relieve the pain of teething, scratches, and scrapes. The mallow leaves have been used to treat constipation.

Actions

Research is lacking on any uses or actions of mallow. To date, no controlled studies for mallow have been carried out in either laboratory animals or humans. The only studies available focus on its chemical composition; therefore mallow should be used only under the supervision of a qualified herbalist.

Product Availability

Dried herb, fluid extract

Plant Parts Used: Dried flowers, dried leaves

Dosages

- Adult PO infusion (leaf): mix 5 g dried herb (leaf) with boiling water, let stand, strain, drink daily before bedtime
- Adult PO flower tea: 1.5-2 g of dried flowers in 150 ml boiling water × 10 min, strain; up to 5 g ingested per day (Jellin et al, 2008)
- Adult PO dried herb: 5 g daily

Contraindications

Until more research is available, mallow should not be used during pregnancy and breastfeeding. It should not be given to children. Mallow should not be used by persons with hypersensitivity to it. Do not confuse mallow with marshmallow, musk mallow, or dwarf mallow.

Side Effects/Adverse Reactions

INTEG: Hypersensitivity reactions
MS: Tremors, shaking

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Phytoalexin	Malvone A (Veshkurova, 2006)	

Continued

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Glycoside		
Tannin		Wound healing; astringent
Mucilage	Galacturonorhamane; Arabinogalactane, Galacturonic acid, Rhamnose, Galactose	Emollient, demulcat
Leukocyanin		
Flavonoid	Hypolaetin; Gossypetin	

Client Considerations

Assess

- Assess for hypersensitivity reactions (rare). If present, discontinue the use of mallow and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store mallow products away from heat, insects, and moisture.

Teach Client/Family

- Caution the client not to use mallow in children or those who are pregnant or breastfeeding until more research is available.
- Caution the client not to confuse mallow with marshmallow, musk mallow, or dwarf mallow *(Althaea officinalis)* because they are different herbs.
- Caution the client that this herb should be used only under the supervision of a qualified herbalist. Little research is available.

Marigold

(mar'uh-goeld)

Scientific name: *Calendula officinalis*

Other common names: Calendula, garden marigold, pot marigold, poet's marigold

Origin: Marigold is an annual found in parts of Europe, the United States, and Canada.

Uses

Marigold is used topically to treat skin disorders such as venous stasis ulcers, decubitus ulcers, varicose veins, bruises, boils, and rashes. It also is used topically to help heal chapped, cracked skin and for aromatherapy. Marigold is used internally to treat gastric disorders and promote digestion. It is used both internally and topically to treat inflammation of the oral and pharyngeal mucosa.

= Pregnancy = Pediatric = Alert = Popular Herb

Investigational Uses

Studies are underway to determine the antitumor and antiinfective properties of marigold.

Actions

Antitumor Action

Research is available documenting the use of lutein, a chemical component of marigold, as an antitumor agent. Mice fed a diet of lutein from marigold extract were inoculated after 2 weeks with tumor cells. Cell proliferation was measured for 70 days. Low levels of lutein were found to lower the incidence of mammary tumors, tumor growth, and lipid peroxidation, whereas higher levels were found to be less effective. Researchers concluded that low levels of dietary lutein can decrease mammary tumor development (Park et al, 1998). An earlier study showed similar results (Chew et al, 1996). Two newer studies (Jimenez-Medina et al, 2006; Barajas-Farias et al, 2006) identified the dual and opposite effect of marigold, both chemoprotectant and promoter in hepatocarcinogenesis in the laboratory.

Antiinfective Action

One study evaluated the use of marigold in treating the tick-borne encephalitis virus (Fokina et al, 1991). In mice inoculated with the virus, marigold was only partly effective in killing the virus. Other herbal preparations exhibited much more antiviral activity. Another study examining the effectiveness of various herbs against dermal staphylococcus, streptococcus, and protozoa found that marigold was one of the most active extracts. This information may be useful for the development of products to treat dermal diseases (Molochko et al, 1990).

Product Availability

Mouthwash, ointment, tea, tincture, cream, gel, shampoo

Plant Parts Used: Flowers, leaves

Dosages

- Adult PO tea: 1-4 ml tid
- Adult PO tincture: 1-4 ml tid
- Adult topical ointment: may be applied prn to the affected area

Contraindications

Pregnancy category is 3; breastfeeding category is 2A.
Marigold should not be given to children. Persons with hypersensitivity to marigold or other plants of the Compositae family should not use it.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions

Interactions

Drug

CNS depressants: Marigold may increase sedation when given with central nervous system depressants (Jellin et al, 2008).

Herb

Sedative herbs: Marigold may increase sedative action of sedative herbs (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Triterpenoid	Faradiol	Antiinflammatory
Glycoside		
Lutein		Antitumor
Sterol		
Fatty acid		
Carotenoid pigment		
Polysaccharide		
Volatile oil		
Calendulen		
Sesquiterpene oligoglycosides	Officinosides C, D	
Calendasaponins	A, B, C, D	
Ionone glucosides	Officinosides A, B	

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of marigold and administer an antihistamine or other appropriate therapy.
- Assess whether the client is allergic to other members of the Compositae family. If so, marigold should not be used.

Administer

- Instruct the client to store marigold products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 2A.
- Caution the client not to give marigold to children.
- Inform the client that allergies to this plant can occur and that the use of marigold should be discontinued if necessary.

Marijuana

(mare-uh-wa′ na)

Scientific name: *Cannabis sativa*

Other common names: Anashea, banji bhang, blunt, bud, cannabis, dope, ganga, grass, hash, hashish, hemp, joint, Mary Jane, pot, sinsemilla, weed

Origin: Marijuana is grown wild and is cultivated throughout the world.

Uses

Marijuana has been used for recreation. Dronabinol, which contains cannabis, is used to treat anorexia in appetite loss associated with AIDS and for cancer chemotherapy induced nausea. It is also helpful to reduce intraocular pressure in glaucoma.

Actions

Short-term marijuana by inhalation increases bronchodilation. However, long term it impairs lung function and leads to constrictive lung disease. It decreases intraocular pressure in glaucoma and increases the appetite (Jellin et al, 2008). In one study (Zuardi et al, 2006) cannabidiol, one of the chemical components of marijuana, showed anxiolytic and/or antipsychotic actions.

Product Availability

Tincture, fluid extract, inhalation

Plant Part Used: Leaf flower

Dosages

- Adult PO tincture: 5-15 drops
- Adult fluid extract: 1-3 drops
- Adult dronabinol: 5-15 mg/m^2 every 2-4 hr
- Adult inhalation: 1-3 grains smoked

Contraindications

Marijuana should not be used in children or those who are pregnant or breastfeeding.

Side Effects/Adverse Reactions

CNS: Impaired reaction time, panic reactions, hallucinations, depression, emotional disturbances (marijuana intoxication)
CV: Tachycardia, hypotension, hypertension, palpitations
EENT: Red eyes, sore throat
GI: Nausea, vomiting, dry mouth

Interactions

Drug

CNS depressants: Marijuana increases the effect of central nervous system depressants.

Pharmacology

Pharmacokinetics

Absorbed into fat cells, remains in the urine for at least 10 days.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Cannabinoids	TCH	
	Dronabinol	
	Cannabidiol	Antipsychotic

Client Considerations

Assess

- Assess the reason the client is using marijuana.
- Identify if the client is taking any other central nervous system depressants that should not be taken with this product.

Administer

- Keep marijuana in a dry area away from direct sunlight.

Teach Client/Family

- Teach the client that marijuana should not be used in children or those who are pregnant or breastfeeding until more research is available.

Marjoram

(mahr'juh-ruhm)

Scientific name: *Origanum majorana* L.

Other common names: Garden marjoram, knotted marjoram, oleum majoranae (oil), sweet marjoram

Origin: Marjoram is found throughout the world.

Uses

Marjoram has been used as a diuretic and to treat bruises, headache, cough, paroxysmal cough, rhinitis, amenorrhea, dysmenorrhea, arthritis, muscle pain and stiffness, insomnia, motion sickness, and snakebite. The essential oil is used topically for pain. Marjoram is also used as a food flavoring.

Investigational Uses

Marjoram may be used in Alzheimer's disease.

Actions

Only a few studies on marjoram have been published. Among them are investigations into the use of marjoram as an antiinfective and for the treatment of eczema.

Eczema Treatment

One researcher evaluated the use of marjoram in the treatment of childhood atopic eczema (Anderson et al, 2000). In this study, eight children received massage with essential oils (aromatherapy) as part of their medical regimen to control eczema. One of the essential oils preferred by the mothers doing the massage was marjoram. A significant improvement occurred in the eczema in this group.

Other Actions

The ursolic acid in *Origanum majorana* demonstrated a potent acetylcholinesterase inhibitor and therefore should be useful in Alzheimer's disease (Chung et al, 2001). Antimicrobial activity was identified against seven fungi: *Fusarium solani, Candida albicans, Aspergillus niger, A. parasiticus, Rhizopus oryzae, Rhizoctonia oryzae sativae,* and *Altemaria brassicicola* (Leeja et al, 2007). Marjoram may also be effective in lead toxicity. There is a protective effect of the volatile oil, alcoholic and aqueous extracts of marjoram (el-Ashmawy et al, 2005).

Product Availability

Tea, tincture, essential oil

Plant Parts Used: Dried leaves, flowering tops

Dosages

- Adult PO tea: add 1-2 tsp dried leaves and flowering tops to 8 oz boiling water, let stand 10 min, take bid-tid
- Adult PO tincture: 1 tsp daily

- Adult topical: may be used as a poultice or mouthwash (Jellin et al, 2008)
- Adult topical essential oil: apply as needed to affected area

Contraindications

Class 1 herb (leaf).

Until more research is available, marjoram should not be used therapeutically during pregnancy and breastfeeding. It should not be given therapeutically to children. Marjoram should not be used therapeutically by persons with hypersensitivity to this herb or other members of the *Labiatae* family, including mint, basil, thyme, oregano, hyssop, and sage.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, diarrhea

INTEG: *Serious hypersensitivity reactions*

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Lactone	Thymol Carvacrol	Antiinfective
Flavonoid	Diosmetin; Luteolin; Apigenin	
Tannin		Astringent; wound healing
Hydroquinone		Cytotoxic
Glycoside	Arbutin; Methylarbutin; Vitexin; Orientin; Thymonin	
Triaconatane		
Sitosterol		
Acid	Oleanolic acid	
	Ursolic acid	Potent acetylcholinesterase inhibitor
	Rosmarinic acid; Caffeic acid; Chlorogenic acid	

Client Considerations

Assess

- Assess for hypersensitivity reactions (facial edema, inability to breathe, itching, dysphagia, dysphonia). If these symptoms are present, discontinue the use of marjoram and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client not to use marjoram long term because of its arbutin content.
- Instruct the client not to use the essential oil internally.
- Instruct the client to store marjoram products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use marjoram therapeutically in children or those who are pregnant or breastfeeding until more research is available. It should be used as a food flavoring only.
- Inform the client that marjoram is not the same herb as oregano.
- Advise the client that cross-sensitivity may occur with other herbs of the *Labiatae* family, such as oregano, thyme, hyssop, basil, mint, sage, and lavender.
- Advise the client to use marjoram for short periods of time, and to stop taking if GI symptoms occur.

Marshmallow

(mahrsh'meh-low)

Scientific name: *Althea officinalis*

Other common names: Althaea root, althea, mortification root, sweetweed, wymote

Origin: Marshmallow is a perennial found in Europe and the United States.

Uses

Marshmallow is used traditionally to suppress cough and relieve sore throat and gastric disorders such as irritable bowel syndrome, gastritis, and constipation. Topically, it is used to treat minor skin disorders.

Actions

Very little primary research is available for marshmallow. Existing studies focus primarily on its antitussive and antiinfective properties.

Antitussive Action

One study evaluated the antitussive action of marshmallow and other nonnarcotic antitussives on cats (Nosal'ova et al, 1992). A nylon fiber was used to mechanically stimulate the mucous area of the respiratory system, and cough was evaluated on the basis of lateral tracheal pressure. The antitussive effect of marshmallow was found to be stronger than that of some of the nonnarcotic antitussives evaluated, which are not available in the United States.

Antiinfective Action

In a study focusing on the antiinfective properties of marshmallow and several other herbs against *Vibrio cholerae,* marshmallow was found to be less effective than some of the other plants evaluated (Guevara et al, 1994).

Product Availability

Capsules, dried flowers, dried leaves, dried whole root, syrup

Plant Parts Used: Dried flowers, dried leaves, dried root

Dosages

Throat Irritation

- Adult PO syrup: 10 ml as a single dose (Blumenthal, 1998)

Other

- Adult PO dried leaves: 5 g daily (Blumenthal, 1998)
- Adult PO dried root: 6 g crude herb daily (Blumenthal, 1998)
- Adult PO powdered, crushed plant: whole or part, 2 g/day

Contraindications

Pregnancy category is 3; breastfeeding category is 2A.
Marshmallow, medicinally should not be given to children. Persons who are hypersensitive to this herb should not use it.

Side Effects/Adverse Reactions

ENDO: Hypoglycemia
GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions

Interactions

Drug

Antidiabetics: Marshmallow may increase hypoglycemic action of antidiabetes agents (Jellin et al, 2008).
Iron salts: Marshmallow may reduce the absorption of iron salts; separate by 2 hours.
Oral medications: Marshmallow may reduce the absorption of oral medications; do not use concurrently.

Herb

Hypoglycemic herbs: Marshmallow may increase the effects of hypoglycemic herbs (Jellin et al, 2008).

Lab Test

Blood glucose: Marshmallow decreases blood glucose.

M

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Polysaccharide	Arabinogalactans; Arabans; Glucans; Galacturonic rhamnans	
Flavonoid	Quercetin; Kaempferol Scopoletin	Antiinflammatory
Pectin		
Starch		
Calcium oxalate		
Sterol		
Fat		
Coumarin		
Phenolic acid	Caffeic acid; Syringic acid; Chlorogenic acid; Ferulic acid	
Mucilage		Antiinfective

Client Considerations

Assess

- Assess the reason the client is using marshmallow.
- Assess for hypersensitivity reactions. If present, discontinue the use of marshmallow and administer an antihistamine or other appropriate therapy.
- Assess for oral medication or antidiabetic use (see Interactions).

Administer

- Instruct the client to store marshmallow products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 2A.
- Caution the client not to give marshmallow medicinally to children.
- Advise diabetic clients to avoid using this product.

Mayapple

(may'a-puhl)

Scientific name: *Podophyllum peltatum*

Other common names: American mandrake, devil's-apple, duck's foot, ground lemon, hog apple, Indian apple, mandrake, raccoon berry, umbrella plant, wild lemon, wild mandrake

Origin: Mayapple is a perennial found in the United States and Canada.

Uses

Mayapple has been used in China to treat snakebites, general weakness, poisoning, lymphadenopathy, condyloma acuminata, and cancer. In Western medicine, mayapple has been used as a laxative. Topically, the concentrated tincture and resin are useful for removing warts and condyloma.

Actions

Very few research studies have been done on mayapple. The few that are published deal with the toxicity of podophyllotoxin, one of its chemical components.

Podophyllotoxin Intoxication

One study using rats revealed severe nervous system changes when mayapple was injected. The changes included increased coarseness of nerve fibers in the cerebellum, cerebral cortex, brainstem, and spinal cord. Neuronal swelling also occurred. Although the nervous system was the only system studied, toxicity undoubtedly occurs in other systems as well (Chang et al, 1992). Other studies showed similar results (Eyberger et al, 2006; Kao et al, 1992).

Product Availability

Concentrated tincture (by prescription), dried rhizome, fluid extract (by prescription), resin, tincture

Plant Part Used: Rhizome

Dosages

Wart Removal

- Adult topical concentrated tincture: apply to wart, leave on for up to 6 hr, wash off; may be used every wk for up to 4 wk
- Adult topical resin: apply to wart bid for 3 days, repeat every wk for 5 wk; do not wash off

Other

- Adult PO fluid extract: 1.5-3 g daily (Blumenthal, 1998)
- Adult PO powdered root: 10-30 grains
- Adult PO tincture: 2-10 drops daily-bid; 2.5-7.5 g daily (Blumenthal, 1998)

Contraindications

Class 2b/3 herb (root).

Until more research is available, mayapple should not be used during pregnancy and breastfeeding. It should not be given to children. Mayapple should not be used by geriatric clients, debilitated persons, or those who are hypersensitive to the root. Persons with gallbladder disease, intestinal obstruction, or diabetes should avoid its use. All parts of the mayapple plant except the ripe fruit are toxic both orally and topically. Mayapple should not be used topically on large areas or on irritated warts, moles, or birthmarks.

Side Effects/Adverse Reactions

CNS: Confusion, dizziness, headache, psychosis, hallucinations, *seizures, stupor, coma*

GI: Nausea, vomiting, anorexia, diarrhea, abdominal pain, *hepatotoxicity*

HEMA: *Leukopenia, thrombocytopenia, anemia*

INTEG: Hypersensitivity reactions

MISC: Weakness, orthostatic hypotension

Podophyllotoxin Intoxication: *Nausea, vomiting, diarrhea, abdominal pain, thrombocytopenia, leukopenia, abnormal hepatic function tests, ataxia, numbness, altered consciousness*

RESP: Shortness of breath, *apnea*

Interactions

Drug

Belladonna alkaloids, ipecac: Belladonna alkaloids, ipecac may decrease the laxative effects of mayapple; do not use concurrently.

Cardiac glycosides: Do not use mayapple with cardiac glycosides; may increase toxicity (Jellin et al, 2008).

***Diuretics** (potassium-losing):* Mayapple when given with potassium-losing diuretics may increase hypokalemia (Jellin et al, 2008).

Herb

Cardiac glycoside herbs: Do not use concurrently; may increase cardiac glycoside toxicity (Jellin et al, 2008).

Potassium-depleting herbs: Administration of mayapple with potassium-depleting herbs may increase hypokalemia (Jellin et al, 2008).

Laxative herbs: Hyoscyamus, lobelia, and leptandra may decrease the laxative effect of mayapple; do not use concurrently.

Continued

Interactions—cont'd

Food

Salt: Salt may increase the laxative effect of mayapple; do not use concurrently.

Lab Test

AST, ALT, BUN, creatitine: Mayapple may cause increased AST, ALT, BUN, creatitine.

HCT, WBC, platelets, red blood cells: Mayapple may cause decreased HCT, white blood cells, platelets, red blood cells.

Pharmacology

Pharmacokinetics

Pharmacokinetics and pharmacodynamics are unknown. Mayapple is antimitotic.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Podophyllotoxin		Antimitotic; toxic
Picropodophyllin	Alpha, beta pellatin	Antimitotic; toxic
Resin		
Flavonoid	Quercetin	Antiinflammatory
Starch		

Client Considerations

Assess

- Assess the reason the client is using mayapple.
- Assess for hypersensitivity reactions. If present, discontinue the use of mayapple and administer an antihistamine or other appropriate therapy.
- Assess for the symptoms of podophyllotoxin intoxication: nausea, vomiting, diarrhea, abdominal pain, thrombocytopenia, leukopenia, abnormal hepatic function tests, ataxia, numbness, and altered consciousness.
- Assess for the use of medications, herbs, and salt (see Interactions).

Administer

- Instruct the client to treat only 25 cm^2 at a time. Mayapple is extremely irritating to skin and mucous membranes.
- Instruct the client to store mayapple products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use mayapple in children or those who are pregnant or breastfeeding until more research is available.
- Caution the client that all parts of the mayapple plant except the ripe fruit are toxic, both orally or topically.
- Advise the client that the health care provider may use mayapple to treat genital, vaginal, or perianal warts.

= Pregnancy = Pediatric = Alert = Popular Herb

Meadowsweet

(meh′dow-sweet)

Scientific names: *Filipendula ulmaria, Spiraea ulmaria*

Other common names: Bridewort, dolloff, dropwort, fleur d'ulmaire, flores ulmariae, gravel root, meadow queen, meadwort, mede-sweet, queen of the meadow, spierstaude

Origin: Meadowsweet is a perennial shrub found in Europe and North America.

Uses

Traditionally, meadowsweet has been used to treat gastrointestinal disorders such as gastritis, heartburn, indigestion, irritable bowel syndrome, and peptic ulcer disease. It has also been used to treat urinary tract infections, joint and rheumatic muscle pains, headache, fever, colds, and cancer.

Actions

Anticoagulant Action

In one study focusing on the anticoagulant effects of meadowsweet, extracts were administrated orally and anticoagulant levels tested (Liapina et al, 1993). The flowers and seeds showed a high level of anticoagulant activity. Another study using various methods showed that all components of meadowsweet exhibit heparin-like action (Kudriashovv et al, 1991). A third study showed similar results (Kudriashovv et al, 1990).

Antiinfective Action

A study evaluating the antimicrobial effects of various herbs found that those with the greatest effect against bacteria were meadowsweet, willow herb, cloudberry, and raspberry (Rauha et al, 2000, Ryzhikov et al, 2006).

Antioxidant Action

When researchers used spectrometry to evaluate the antioxidative activity of 92 phenolic extracts from plants, meadowsweet showed a high level of antioxidative activity calculated as gallic acid equivalents (Kahkonen et al, 1999).

Anticancer Action

One study found that meadowsweet caused a significant decrease in precancerous changes in mice. Mice with cervical dysplasia or carcinoma of the vagina were given meadowsweet prepared from flowers. A 67% drop in dysplasia occurred, and no recurrence was observed in 10 subjects considered completely cured in 1 year (Peresun'ko et al, 1993). Spiridonov et al (2005) studied the cytotoxicity of Russian ethnomedicinal plants including meadowsweet. The crude ethanol extract tested on cell growth exceeded the cytotoxicity of cyclophosphamide and fluoracil.

Antiulcer Action

One foreign study has demonstrated the antiulcer action of meadowsweet. The herb was shown to decrease formation of stomach lesions when reserpine injections were given to rats or mice (Barnaulov et al, 1980).

Product Availability

Dried flowers, dried herb, fluid extract, infusion, powder, tablets, tincture

Plant Parts Used: Dried flowers, other above-ground parts

Dosages

- Adult PO dried flowers: 2.5-3.5 g daily (Blumenthal, 1998)
- Adult PO dried herb: 1.5-5 g bid-tid
- Adult PO fluid extract: 2-3 ml tid (1:1 dilution in 25% alcohol)
- Adult PO infusion: 3-6 g prepared with 100 ml every 2 hr
- Adult PO powder: ½ tsp dissolved in 1 oz water
- Adult PO tincture: 2-4 ml bid-tid (1:5 dilution in 25% alcohol)

Contraindications

Pregnancy category is 4; breastfeeding category is 3A.
Meadowsweet should not be given to children. It should not be used by persons with asthma or hypersensitivity to salicylates.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions
RESP: *Bronchospasm*

Interactions

Drug

Anticoagulants: Anticoagulants (heparin, warfarin), and salicylates may increase the risk of bleeding when used with meadowsweet; avoid concurrent use.
Iron salts: Meadowsweet may decrease the absorption of iron salts; separate by 2 hours.
Opioids: Meadowsweet may increase the action of opioids (Jellin et al, 2008).

Herb

Anticoagulant herbs: Meadowsweet given with anticoagulant herbs may increase risk of bleeding (theoretical).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Flavonoid	Quercetin; Naringenin; Flavone	Antimicrobial
	Kaempferol	Antiinflammatory
	Spiraeoside; Avicularin; Hyperoside	
Phenolic glycoside	Spiraein	Antioxidant
	Monotropin; Primaverosides	
Tannin		Wound healing; astringent
Salicin		Antiinflammatory

= Pregnancy = Pediatric = Alert = Popular Herb

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Volatile oil	Methylsalicylate Salicylaldehyde; Gaultherin; Isosalicin; Monotropitin; Salicylic acid; Spirein	Anticoagulant
Coumarin **Mucilage** **Ascorbic acid**		Anticoagulant

Client Considerations

Assess

- Assess the reason the client is using meadowsweet.
- Assess for hypersensitivity reactions. If present, discontinue the use of meadowsweet and administer an antihistamine or other appropriate therapy. Clients with salicylate sensitivity or asthma should not use this herb.
- Assess for the use of anticoagulants (heparin, warfarin), salicylates; these drugs should be avoided when using this herb (see Interactions).
- Monitor coagulation studies if the client is taking high doses of meadowsweet over a long period.

Administer

- Instruct the client to store meadowsweet products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 4 and breastfeeding category is 3A.
- Caution the client not to give meadowsweet to children.

M

Melatonin

(meh-luh-toe'nuhn)

Scientific name: *N*-Acetyl-5-methoxytryptamine

Other common name: MEL, MLT, Pineal hormone

Origin: Melatonin is a naturally occurring hormone in the body.

Uses

Melatonin is used to treat insomnia and inhibit cataract formation. It is also used to increase longevity, treat epilepsy, hypertension, various cancers, and jet lag, and prevent weight loss in cancer patients. Because it lowers luteinizing hormone (LH), estradiol, and progesterone levels, melatonin could possibly be useful as a contraceptive (Voordouw, 1992).

Actions

Melatonin is a hormone produced in the body by the pineal gland. It is an antioxidant and a free-radical scavenger (Reiter et al, 1995). When tryptophan is converted to serotonin, melatonin results from enzymatic processes in the pineal gland. Melatonin production increases during sleep and decreases during waking hours (James et al, 1989). Melatonin supplementation has been found to induce and maintain sleep in adults who have low melatonin levels. The most promising use is for the geriatric client, who typically has low melatonin levels. Melatonin treatment in vivo caused a significant increase in blood glucose and a decreased level of free fatty acids (Fabis et al, 2002). Parkinson's disease may be treated with melatonin, which lacks any serious side effects (Antolin et al, 2002).

Product Availability

Extended release capsules: 3 mg; injectable; liquid: 500 mcg/ml; tablets: 500 mcg, 1 mg, 1.5 mg, 3 mg

Dosages

Cancer (as a Single Agent)

- Adult PO 20 mg daily × 2 mo IM (injectable form), then 10 mg PO daily

Cancer (in Combination with Interleukin-2)

- Adult PO: 40-50 mg at bedtime for 1 wk before interleukin-2

Chronic Insomnia

- Adult PO tablets: 75 mg at bedtime (Murray, Pizzorno, 1998)

Delayed Sleep-Phase Syndrome

- Adult PO: 5 mg at bedtime

Jet Lag

- Adult PO: 5 mg daily 2-3 days before and 3 days after travel

Chronic Insomnia

- Geriatric PO tablets: extended release 1-2 mg 2 hr before meals

Contraindications

Until more research is available, melatonin should not be used during pregnancy and breastfeeding. It should not be given to children. Persons with hypersensitivity to melatonin and those with hepatic or cardiovascular disease, central nervous system disorders, or depression should not use it. Persons with renal disease should use melatonin with caution. Use only synthetic forms due to contamination of animal products.

Side Effects/Adverse Reactions

CNS: Headache, change in sleep patterns, confusion, hypothermia, sedation
CV: *Tachycardia*
GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions (rash, pruritus)
Reproductive: Decreased progesterone, estradiol, LH levels

Interactions

Drug

Anticoagulants, antiplatelets: Melatonin with anticoagulants, antiplatelets may increase the risk of bleeding (theoretical) (Jellin et al, 2008).

Interactions—cont'd

Antidiabetics: Melatonin with antidiabetics may decrease hypoglycemia (theoretical) (Jellin et al, 2008).
Benzodiazepines: Melatonin may increase the anxiolytic effects of benzodiazepines; use together cautiously.
Beta-blockers: Melatonin is able to reverse the negative action of beta-blockers on sleep (Jellin et al, 2008).
CNS depressants: Melatonin with central nervous system depressants may increase sedation (theoretical) (Jellin et al, 2008).
Cerebral stimulants: Cerebral stimulants used with melatonin may have a synergistic effect and exacerbate insomnia; avoid concurrent use.
DHEA: DHEA (dehydroepiandrosterone) used with melatonin may decrease cytokine production; avoid concurrent use.
Immunosuppressants: Melatonin with immunosuppressants concurrently may decrease response to immunosuppressants (Jellin et al, 2008).
Magnesium: Magnesium used with melatonin increases inhibition of *N*-methyl-D-aspartate (NMDA) receptors; avoid concurrent use.
Succinylcholine: Melatonin increases the blocking properties of succinylcholine; avoid concurrent use.
Zinc: Zinc used with melatonin increases inhibition of NMDA receptors; avoid concurrent use.

Herb

Anticoagulant/antiplatelet herbs: Melatonin with anticoagulant/antiplatelet herbs may increase the risk of bleeding (theoretical) (Jellin et al, 2008).
Sedative herbs: Melatonin with sedative herbs may increase sedation (theoretical) (Jellin et al, 2008).

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of melatonin and administer an antihistamine or other appropriate therapy.
- Assess sleep patterns: ability to fall asleep, stay asleep, hours slept, and napping, if using for insomnia.
- Assess for CNS effects: confusion, headache, sedation, and changes in sleeping patterns.
- Assess for medications used (see Interactions).

Administer

- Instruct the client to take melatonin PO to treat insomnia or jet lag. Melatonin is administered both PO and IM to cancer patients.
- Instruct the client to store melatonin products in a sealed container away from heat and moisture.

Teach Client/Family

- Caution the client not to use melatonin in children or those who are pregnant or breastfeeding until more research is available.
- Advise the client to avoid use with magnesium, zinc, and DHEA.
- Advise the client to notify their health care provider of all supplements taken.

Milk Thistle

(milk thi'suhl)

Scientific name: *Silybum marianum*

Other common names: Holy thistle, lady's thistle, Marian thistle, Mary thistle, St. Mary thistle

Origin: Milk thistle is found in Kashmir, Mexico, Canada, and the United States.

Uses

Milk thistle has been used to treat hepatotoxicity caused by poisonous mushrooms, cirrhosis of the liver, chronic candidiasis, hepatitis C, exposure to toxic chemicals, and liver transplantation.

Actions

Hepatoprotective Action

Several studies have demonstrated the hepatoprotective action of silymarin, a chemical component of milk thistle (Ball et al, 2005; Gordon et al, 2006; Thamsborg et al, 1996). One of these studies noted that silymarin has been used for centuries to treat hepatic and gallbladder conditions (Flora et al, 1998). Silymarin has been found to act as an antioxidant, decreasing free radicals and increasing hepatocyte synthesis as well as exerting other hepatoprotective effects. It has been used to treat acute and chronic hepatic disease and has been found to inhibit cytochrome P450 enzymes in liver microsomes (Beckmann-Knopp et al, 2000). It is possible that drugs metabolized by CYP3A4 or CYP2C9 may interact with this herb. One study using sheep orally infected with sawfly larvae demonstrated a positive response when silymarin was used to treat the resultant hepatotoxicosis (Thamsborg et al, 1996). Milk thistle has shown promise to treat hepatitis C with few side effects. Silymarin has hepatoprotective, antiinflammatory, and regenerative properties (Giese, 2001).

Nephroprotective Action

A study done on African green monkeys confirmed the nephroprotective effects of silibinin and silicristin, two of milk thistle's chemical components (Sonnenbichler et al, 1999). Kidney cells that had been damaged by cisplatin, vincristine, and paracetamol showed lessened or no nephrotoxic effects.

Product Availability

Tincture, capsule

Plant Parts Used: Seeds, above-ground parts

Dosages

Alcoholism

- Adult PO tincture: 70-210 mg tid (70%-80% silymarin) (Murray, Pizzorno, 1998)

General Dosages

- Adult PO tincture: 200-400 mg daily (dosage standardized to silymarin content) (Blumenthal, 1998)

Hepatitis

- Adult PO tincture: 140-210 mg tid (70%-80% silymarin) (Murray, Pizzorno, 1998)

Amanita Phalloides Mushroom Poisoning

- Adult IV: 20-50 mg/kg/24 hr, divided in 4 doses, give each infusion over 2 hr (not available in United States) (Jellin et al, 2008)

Contraindications

Class 1 herb (seed).

Until more research is available, milk thistle should not be used during pregnancy and breastfeeding. It should not be given to children. Milk thistle should not be used by persons with hypersensitivity to this herb or other plants in the Asteraceae family (ragweed, daisy, marigolds, chrysanthemums). Do not use in those with hormone-sensitive cancers.

Side Effects/Adverse Reactions

CNS: Headache
GI: Nausea, vomiting, anorexia, diarrhea
GU: Menstrual changes
INTEG: Hypersensitivity reactions

Interactions

Drug

***Antineoplastics** (platinum):* Milk thistle may prevent nephrotoxicity from platinum antineoplastics.
Cytochrome P450 2C9, 3A4 substrates: Milk thistle may inhibit these substrates (Jellin et al, 2008).
Estrogens: Milk thistle may inhibit the clearance of estrogen (theoretical) (Jellin et al, 2008).

Lab Test

AST, ALT, alkaline phosphatase, blood glucose: Milk thistle may decrease AST, ALT alkaline phosphatase, blood glucose levels.

M

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Flavonoid	Silybine Isosilybine; Silycristine; Silidianine; Taxifoline (Quaglia et al, 1999)	Hepatoprotective
Flavonolignan	Dehydrosilybin; Siliandrin; Silyhermin	
Apigenin		
Acid	Linoleic acid; Oleic acid; Palmitic acid	
Tocopherol		
Sterol	Sitosterol; Cholesterol; Campesterol; Stigmasterol	
Mucilage		

Client Considerations

Assess

- Assess the reason the client is using milk thistle.
- Assess for hypersensitivity reactions. If present, discontinue the use of milk thistle and administer an antihistamine or other appropriate therapy.
- Monitor hepatic function tests (ALT, AST, bilirubin) if the client is using milk thistle to treat hepatic disease.
- Assess all medications used (see Interactions).

Administer

- Instruct the client to store milk thistle products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use milk thistle in children or those who are pregnant or breastfeeding until more research is available.

Mistletoe, European

(mi'suhl-toe)

Scientific name: *Viscum album*

Other common names: All heal, birdlime, devil's fuge, mystyldene

Origin: Mistletoe is a parasite found in Europe, Asia, and North America depending on species.

Uses

Mistletoe has been used to treat hypertension, anxiety, seizure disorders, insomnia, depression, infertility, gout, hysteria, internal bleeding, and atherosclerosis.

Investigational Uses

Research is underway to determine the usefulness of mistletoe in the treatment of cancer.

Actions

Mistletoe has been used parenterally for many years in cancer patients. The majority of the research on mistletoe focuses on its antineoplastic activity.

Antineoplastic Action

One study demonstrated that mistletoe lengthens the survival time of cancer patients. In this study the survival time of patients treated with mistletoe was a median of 9.18 years, compared with 7.54 years for those not treated with mistletoe. However, this difference is not considered statistically significant (Stumpf et al, 2000). Another study (Stein et al, 2000) found that mistletoe induces apoptosis in lymphocytes and tumor cells. However, the research on the usefulness of mistletoe for the treatment of cancer has shown inconclusive results. A newer study (Zuzak et al, 2006) identified that pediatric medulloblastoma cells responded to *Viscum album*.

Anti-HIV Action

Another study showed that mistletoe produces immunomodulatory effects when given to HIV-infected patients and may slow the progression of the disease (Gorter et al, 1999).

Product Availability

Capsules, dried leaves, stems, fluid extract, infusion, tablets, tincture; parenterally (not available in United States)

Plant Parts Used: Branches, fruit, leaves

Dosages

- Adult PO dried leaves: 3-6 g tid
- Adult PO fluid extract: 2-3 ml tid (1:1 dilution in 25% alcohol)
- Adult PO tincture: 0.5 ml bid-tid (1:5 dilution in 45% alcohol)

Contraindications

Class 2d herb *(Viscum album)*.

Because it is a uterine stimulant, mistletoe should not be used during pregnancy. Until more research is available, this herb should not be used during breastfeeding and should not be given to children. Mistletoe should not be used by persons who are hypersensitive to the plant. Persons with protein oversensitivity and those with chronic progressive infections should avoid its use. Mistletoe is a toxic plant and should be kept out of the reach of children.

Side Effects/Adverse Reactions

CNS: *Coma, seizures,* delirium, hallucinations, psychosis
CV: Bradycardia, hypotension or hypertension, *cardiac arrest*
GI: Nausea, vomiting, anorexia, diarrhea, gastritis, *hepatitis, hepatotoxicity*
GU: *Nephrotoxicity*
INTEG: Hypersensitivity reactions
MISC: Mydriasis, myosis, leukocytosis

Interactions

Drug

Antihypertensives: Mistletoe may increase the hypotensive effect of antihypertensives; avoid concurrent use.

Cardiac glycosides (digoxin): Use of mistletoe with cardiac glycosides such as digoxin, digitoxin, and calcium channel blockers may cause decreased cardiac function; avoid concurrent use.

Immunosuppressants: Immunosuppressants such as azathioprine, basiliximab, cyclosporine, muromonab, sirolimus, and tacrolimus may stimulate immunity when used with mistletoe; avoid concurrent use.

Iron salts: Mistletoe may decrease the absorption of iron salts; separate by 2 hours.

Herb

Hawthorn: European mistletoe may decrease the action of positive inotropic agents (hawthorn) (Jellin et al, 2008).

Lab Test

ALT, AST, total bilirubin, urine bilirubin, lymphocyte counts: Mistletoe may cause increased ALT, AST, total bilirubin, urine bilirubin, and lymphocyte counts.

Red blood cells: Mistletoe may cause decreased red blood cells.

Pharmacology

Pharmacokinetics

Pharmacokinetics and pharmacodynamics are unknown. Stimulates cuti-visceral reflexes following inflammation.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Amine	Tyramine	Uterine stimulant
Acetylcholine		
Histamine		
Tyramine		
Phoratoxin		
Choline		
Betaphenylethylamine		
Viscotoxin		
Flavonoid	Quercetin; Kaempferol	Antioxidant
Phenyl alyl alcohol	Syringen	
Lectin		
Sugar alcohol	Mannitol; Quebrachitol; Pinitol; Viscumitol	
Terpenoid		
Alkaloid		
Tannin		Wound healing; astringent

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of mistletoe and administer an antihistamine or other appropriate therapy.
- Assess for life-threatening adverse reactions: cardiac involvement, hepatitis.
- Assess for other adverse reactions: chills, fever, headache, angina, orthostatic hypotension, hypertension.
- Assess all medication use (see Interactions).

Administer

- Instruct the client to store mistletoe products away from light, heat, and moisture.

Teach Client/Family

- Caution the client not to use mistletoe during pregnancy because it is a uterine stimulant. Until more research is available, caution the client not to use this herb during breastfeeding and not to give it to children.
- Advise the client that mistletoe is a toxic plant and should be kept out of reach of children.

Monascus

(muhn-az′kuhs)

Scientific names: *Monascum purpureus, Monascum anka*

Other common names: Hong qu, red rice yeast, red yeast rice, zhi tai, xue zhi kang

Origin: Monascus is a yeast made by fermentation.

= Pregnancy = Pediatric = Alert = Popular Herb

Uses

Marketed as Cholestin, monascus is used to treat hypercholesteremia. It is also used to treat gastrointestinal upset and circulatory problems.

Investigational Uses

Research is underway to determine the efficacy of monascus as an antimicrobial, antioxidant, and hypolipidemic, as well as for the treatment of liver toxicity.

Actions

Anticholesterol Action

The anticholesterol action of monascus is well documented. It has been found to inhibit HMG-CoA reductase and to decrease low-density lipoprotein (LDL) and very-low-density lipoprotein (VLDL) cholesterol and plasma triglycerides (Lee et al, 2006). This herb has been studied in China for many years, with all studies reporting similar results in the decrease of cholesterol, triglycerides, and LDL cholesterol (Wang et al, 1995; Zhu et al, 1995).

Antimicrobial Action

One study evaluated the antimicrobial effect of "monascus making" in the open air. In this study, monascus was produced and dried in the open air (Kono et al, 1999). When the herb was contaminated with *Micrococcus varians* and *Bacillus subtilis,* it was able to inhibit the growth of these two microorganisms.

Antioxidant and Hepatoprotective Actions

Another study reviewed the antioxidant capabilities of monascus (Aniya et al, 1999) using several types of molds. *Monascus anka* showed the strongest hepatoprotective action in rats. Another study has also confirmed the antioxidant and hepatoprotective actions of monascus (Aniya et al, 1998).

Monoamine Oxidase Inhibition

A study of the chemical components of *Monascus anka* has identified the presence of monankarins A-F, which inhibit monoamine oxidase (MAO). Investigators found the inhibition of MAO-B to be stronger than that of MAO-A (Hossain et al, 1996).

Product Availability

Whole yeast

Plant Part Used: Whole yeast (mold)

Dosages

Hyperlipidemia

- Adult PO: 300-1200 mg bid taken with lovastatin and a HMG-CoA reductase inhibitor

Contraindications

Until more research is available, monascus should not be used during pregnancy and breastfeeding. It should not be given to children. Monascus should not be used by persons with hypersensitivity to it or by those with hepatic diseases such as cirrhosis or fatty liver.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia; *hepatotoxicity (rare)*
INTEG: Hypersensitivity reactions
MISC: *Anaphylaxis*

Continued

Interactions

Drug

Alcohol: Alcohol may affect hepatic function in those taking monascus.
Cyclosporine, gemfibrozil: Monascus with cyclosporine may increase risk of myopathy (theoretical).
Cytochrome P4503A4 inhibitors, HMG-CoA reductase inhibitors: Monascus with these agents may increase adverse reactions.

Herb

Cholesterol-lowering herbs: Monascus may increase the effects of cholesterol-lowering herbs.
Coenzyme Q10: Monascus may decrease coenzyme Q10 levels.
Thyroid activity herbs: Monascus may decrease the action of thyroid activity herbs.
St. John's wort: St. John's wort may decrease the action of monascus.

Food

Grapefruit juice: Monascus with grapefruit juice may increase adverse reactions.

Lab Test

Creatine kinase, hepatic function tests: Monascus may increase results of these tests.
Cholesterol: Monascus may decrease serum cholesterol levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Monankarins A-F		Monoamine oxidase inhibition
Monacolin K		HMG-CoA reductase inhibitor

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of monascus and administer an antihistamine or other appropriate therapy.
- Monitor hepatic function tests (AST, ALT, bilirubin) if the client is using high doses of monascus over a long period.

Administer

- Instruct the client to store monascus products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use monascus in children or those who are pregnant or breastfeeding until more research is available.

Morinda

(mohr-in′duh)

Scientific name: *Morinda citrifolia*

Other common names: Carrywood, hog apple, Indian mulberry, mengkoedoe, mora de la India, noni, ruibarbo caribe, wild pine

Origin: Morinda is a shrub found in Polynesia, Asia, and parts of Australia.

Uses

Morinda has been used in the South Pacific to treat arthritis, heart disease, diabetes, hypertension, and gastrointestinal disease.

Investigational Uses

Research is underway to determine the anticancer, antidiabetic, antimalarial, and anthelmintic properties of morinda.

Actions

Very little research is available on morinda. The few studies that have been completed have focused on its anticancer, antidiabetic, anthelmintic, and antimalarial effects.

Anticancer Action

One study evaluated the anticancer action of morinda on lung cancer in mice. Morinda was found to increase life span in all batches of mice. It is believed to increase immunity by increasing lymphocytes and macrophages (Hirazumi et al, 1994; Wang et al, 2001).

Antidiabetic Action

One newer study (Kamiya et al, 2008) identified the hypoglycemic action related to the chemical components, deacetylasperulosidic acid, asperulosidic acid, lucidin, and morindone.

Anthelmintic Action

Another study identified the anthelmintic action of morinda (Raj, 1975).

Sedative Action

One older study (Younos et al, 1990) found morinda to possess sedative effects when administered to mice.

Antimalarial Action

When the antimalarial effects of morinda were tested, researchers noted a 60% inhibition of *Plasmodium falciparum* growth in vitro (Tona et al, 1999).

Product Availability

Capsules, dried fruit leather, juice, powder

Plant Parts Used: Flowers, fruit, leaves

Dosages

- Adult PO tea: 5-9 g of morinda in 3 cups of boiling water, boil until volume is reduced, cool, divide in half
- Adult PO tincture: 30-60 g of herb in 1 L of alcohol (not rubbing) × 3 months, use 30 ml bid
- Adult topical: Use dried leaves steeped in hot water, applied as needed for fever or stomachache

Contraindications

Until more research is available, morinda should not be used during pregnancy and breastfeeding. It should not be given to children. Morinda should not be used by persons with hyperkalemia or by those with hypersensitivity to it.

Side Effects/Adverse Reactions

CNS: Sedation
GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions
META: Hyperkalemia

Interactions

Drug

ACE inhibitors, angiotensin II receptor antagonists, diuretics *(potassium-sparing):* Morinda juice with these agents may increase the risk of hyperkalemia (Jellin et al, 2008).
Immunosuppressants: Morinda may decrease the effects of immunosuppressants.

Lab Test

Glucose: Morinda may decrease glucose levels.
Potassium: Morinda may increase potassium levels.
Urine tests: Morinda may interfere with urine tests due to change in color (pink to rust) (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid	Xeronine	
Glycosides	Glucopyranosyl; Glucopyranose	
Essential oil	Hexoic acid; Octoic acids	
Anthraquinone	Damnacanthal,	Antitumor
Morindone	Deacetylasperulosidic acid, Aperulosidic acid, Lucidin, Morindone	Antidiabetic
Alizarin		
Potassium		
Rutin		
Polysaccharide	Noni-ppt	Antitumor

Client Considerations

Assess

- Assess the reason the client is using morinda.
- Assess for hypersensitivity reactions. If present, discontinue the use of morinda and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store morinda products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use morinda in children or those who are pregnant or breastfeeding until more research is available.
- Advise the client not to perform hazardous activities such as driving or operating heavy machinery until physical response to the herb can be evaluated.
- Advise the client that urine may turn pink to rust color.

Motherwort

(muh′thur-wawrt)

Scientific name: *Leonurus cardiaca*

Other common names: I-mu-ts'ao, lion's ear, lion's tail, lion's tart, oman, Roman motherwort, throwwort

Origin: Motherwort is found in Europe, Canada, and the United States.

Uses

Motherwort has been used to treat menstrual disorders and cardiac conditions such as palpitations. It has also been used as an anticoagulant, antiinflammatory, antispasmodic, antianxiety, and anticancer herb, as well as a cardiotonic.

Actions

Few research studies have been done on motherwort, although several different actions have been theorized. Traditionally, this herb has been used for its cardiovascular and uterine stimulant actions. A recent study has focused on its chemoprotective action.

Cardiovascular Action

One study (Xia et al, 1983) identified the ability of motherwort to inhibit platelets and improve coronary circulation in rats. This herb has also been shown to decrease heart rate and increase the force of myocardial contraction, similar to the action of digoxin.

Anticoagulant Action

The anticoagulant action of motherwort was identified in a study with 105 participants. The anticoagulant effect was found to result from a decrease in fibrinogen and blood viscosity (Zou et al, 1989). One of the chemical components responsible for this action may be prehispanolone.

Chemoprotective Action

Two studies done by the same group of researchers (Nagasawa et al, 1990, 1992) demonstrated that motherwort exerts a chemoprotective action in lesions of the breast and uterus. Both studies showed similar results. No effect was seen in pregnancy-dependent mammary tumors, mammary hyperplastic alveolar nodules, or uterine adenomyosis. In fact, motherwort promoted the growth of pregnancy-dependent mammary tumors and inhibited mammary hyperplastic alveolar nodules.

Product Availability

Dried leaves, fluid extract, tincture

Plant Parts Used: Leaves, seeds

Dosages

- Adult PO: 4.5 g daily (Blumenthal, 1998); 2 g of dried above-ground parts or 1 cup of tea tid (Jellin et al, 2008)
- Adult PO fluid extract: 4.5 ml (1:1 dilution)
- Adult PO tincture: 22.5 ml (1:5 dilution)

Contraindications

Pregnancy category is 4; breastfeeding category is 2A.
Motherwort should not be given to children. It should not be used by persons with thrombocytopenia or hypersensitivity to this herb or other members of the *Labiatae* family.

Side Effects/Adverse Reactions

CV: Decreased heart rate
GI: Nausea, vomiting, anorexia, diarrhea, stomach irritation
HEMA: Increased bleeding time
INTEG: Hypersensitivity reactions, photosensitivity
Reproductive: Uterine bleeding

Interactions

Drug

Anticoagulants *(heparin, warfarin):* Use of motherwort with anticoagulants may cause increased risk for bleeding; avoid concurrent use.
Beta-blockers, cardiac glycosides *(digoxin):* Use of motherwort with beta-blockers, cardiac glycosides may cause decreased heart rate; avoid concurrent use.
CNS depressants: Motherwort can increase the action of central nervous system depressants.
Iron salts: Motherwort may decrease the absorption of iron salts; separate by 2 hours.

Herb

Cardiac glycoside herbs: Do not use motherwort with cardiac glycoside herbs; cardiac glycoside toxicity may occur.

Lab Test

Clotting time: Motherwort increases clotting time.
Creatine phosphokinase: Motherwort interferes with CPK.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid	Stachydrine; Leonurine Betonicine; Turicin; Leunuridin; Leonurinine	Uterine stimulant

= Pregnancy = Pediatric = Alert = Popular Herb

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Saponin		
Ursolic acid		Antiviral, antitumorigenic
Flavone		
Cardanolide		
Glycoside		
Prehispanolone		Anticoagulant
Iridoid		
Tannin		
Terpenoid		
Triterpene		
Lavandulifolioside		Prolongs P-Q, Q-T intervals, QRS complex; decreases blood pressure

Client Considerations

Assess

- Assess the reason the client is taking motherwort.
- Assess for hypersensitivity reactions. If present, discontinue the use of motherwort and administer an antihistamine or other appropriate therapy.
- Assess for photosensitivity if the client is taking motherwort in high doses.
- Assess for risks of bleeding: increased bleeding time, bruising, bleeding gums, hematuria, and hematemesis.

Administer

- Instruct the client to store motherwort products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 4 and breastfeeding category is 2A.
- Caution the client not to give motherwort to children.
- Because it can cause photosensitivity, advise the client to stay out of the sun or to wear protective clothing while using motherwort.

Mugwort

(muhg'wawrt)

Scientific name: *Artemisia vulgaris*

Other common names: Ai ye, common mugfelon herb, sailor's tobacco, St. John's plant, wild wormwood, wort

Origin: Mugwort is a perennial found in North America.

Uses

Mugwort has been used as an anthelmintic and as a treatment for menstrual disorders, persistent vomiting, constipation, colic, diarrhea, depression, and anxiety. The roots have been used to treat psychiatric disorders such as psychoneurosis, neurasthenia, depression, and anxiety.

Investigational Uses

Studies are underway to determine the antibacterial and antifungal properties of mugwort.

Actions

Little research is available to document the actions of mugwort. A few initial studies have become available on its antiviral and antibacterial actions.

Antiviral and Antibacterial Action

One study found mugwort to be active against the herpes simplex virus. Among 78 study participants, a cure occurred in 38, and significant improvement occurred in 37. The remaining three experienced no change in herpetic keratitis caused by HSV-1 (Zheng, 1990). Another study (Chen et al, 1989) determined that mugwort exerts a strong antibacterial effect against *Streptococcus mutans.* Several other herbs were tested in this study, with varying results.

Other Actions

One study (Gilani et al, 2005) found the aqueous-methanol extract of mugwort to be hepatoprotective in induced hepatitis in mice.

Product Availability

Dried leaves, dried roots, fluid extract, infusion, tincture

Plant Parts Used: Leaves, roots

Dosages

- Adult PO tincture: 2-4 ml tid; 10-25 drops (1:5) (Jellin et al, 2008)
- Adult PO tea: 15 g dried herb in 500 ml boiling water, strain; 2-3 cups/day before meals (Jellin et al, 2008)

Contraindications

Class 2b herb (whole herb).

Because it is a uterine stimulant, mugwort should not be used during pregnancy. Until more research is available, this herb should not be used during breastfeeding and should not be given to children. Persons with bleeding disorders or those with hypersensitivity to this herb or other members of the Compositae family should not use mugwort.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions, contact dermatitis
SYST: *Anaphylaxis*

Interactions

Drug

Anticoagulants: Use of mugwort with anticoagulants such as heparin and warfarin may cause increased risk for bleeding; do not use concurrently.

Lab Test

Direct bilirubin: Mugwort may cause an increase in direct bilirubin.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil	Thujone Camphor; Linalool; Cineole; Terpineol; Borneol; Monoterpene	Uterine stimulant
Sesquiterpene lactone		
Glycoside	Quercetin; Rutin	
Coumarin	Aesculetin; Aesculin; Scopoletin; Coumarin; Dioxycoumarin; Umbelliferone	
Polyacetylene		
Triterpene		
Sitosterol		
Stigmasterol		
Carotenoid		

Client Considerations

Assess

- Assess the reason the client is using mugwort.
- Assess for hypersensitivity reactions. If present, discontinue the use of mugwort and administer an antihistamine or other appropriate therapy.
- Assess for the use of anticoagulants (see Interactions).

Administer

- Instruct the client to store mugwort products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use mugwort during pregnancy because it is a uterine stimulant. Until more research is available, caution the client not to use this herb during breastfeeding and not to give it to children.
- Advise the client that mugwort and hazelnut can produce cross-sensitivity reactions.
- Caution the client not to use mugwort if he or she is allergic to hazelnut (Caballero et al, 1997) or other members of the Compositae family.

Mullein

(muh′luhn)

Scientific names: *Verbascum thapsus, Verbasci flos*

Other common names: Aaron's rod, Adam's flannel, bunny's ears, candlewick, flannel-leaf, great mullein, Jacob's staff

Origin: Mullein is a biennial herb found in Europe, Asia, and the United States.

Uses

Mullein is used as an expectorant and antitussive to treat cough, influenza, the common cold, and upper respiratory tract conditions. It is often used in combination with other herbs to treat bronchitis and asthma. Mullein is also used to treat urinary tract infections, chronic otitis media, migraines, and eczema of the ear. Topically, mullein is used for burns, hemorrhoids, frostbite, and inflamed mucosa.

Actions

Very few research studies are available for mullein. Those that have been done focus primarily on its antiviral properties.

Antiviral Action

Two studies have focused on the antiviral action of mullein. In one study, 100 plant extracts were screened for antiviral activity against seven viruses. Mullein was found to be effective against herpesvirus type I (McCutcheon et al, 1995). The other study identified mullein's antiviral activity against herpes suis virus (Zanon et al, 1999).

Other Actions

Another study (Zheng et al, 1993) showed that verbascoside, a chemical component of mullein, possesses antioxidant, anticancer, and antiinflammatory properties.

Product Availability

Capsules, fluid extract, oil

Plant Parts Used: Dried leaves, flowers

Dosages

- Adult PO capsules: 580 mg taken bid with meals
- Adult PO flowers: 3-4 g daily (Blumenthal, 1998)
- Adult PO fluid extract: 1.5-2 ml bid (1:1 dilution)
- Adult PO leaves: place 2 tsp dried leaves in 8 oz boiling water, steep 15 min; may be taken tid
- Adult topical: no typical dosage (Jellin et al, 2008)
- Adult oil: 5-10 drops daily
- Adult powdered, crushed, cut, or whole plant: 2 g/day

Contraindications

Pregnancy category is 3; breastfeeding category is 2A.
Mullein should not be given to children. This herb should not be used by persons with hypersensitivity to it.

Side Effects/Adverse Reactions

CNS: Drowsiness
GI: Nausea, anorexia
INTEG: Hypersensitivity reactions, contact dermatitis

Interactions

Drug

Oral medications: Mullein may decrease the absorption of oral medications; separate by 2 hours.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Saponin Glycoside	Verbascoside; Forsythoside B	Antiinflammatory; antioxidant; antitumor
Complex carbohydrate	D-galactose; Arabinose; D-xylose; D-glucose	
Flavonoid		
Sterol		
Fructose		
Glucose		

Client Considerations

Assess

- Assess the reason the client is using mullein.
- Assess for hypersensitivity reactions, contact dermatitis. If present, discontinue the use of mullein and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store mullein products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 2A.
- Caution the client not to give mullein to children.

Mustard

(muh'stuhrd)

Scientific names: *Brassica nigra, Brassica alba*

Other common names: Black mustard, brown mustard, California rape, charlock, Chinese mustard, Indian mustard, white mustard, wild mustard

Origin: Mustard is found in the Mediterranean region, Europe, and India.

Uses

Mustard traditionally has been used as an emetic, an antiflatulent, for diuresis, to treat inflammation and joint pain, and to increase appetite. However, it is better known for its use in "mustard plaster," which is used topically to treat respiratory congestion (bronchial pneumonia, pleurisy).

Actions

Very little research has been done on mustard. One study evaluated its anticholesterol action, with negative results. No change occurred in the cholesterol levels of rats fed amounts five times that of normal human consumption (Sambaiah et al, 1991). Another study showed that mustard oil used in laboratory animals produced an

anticancer action (Choudhury et al, 1997). Anand et al (2007) identified the antihyperglycemic effect using *Brassica niger* in streptozotocin-induced diabetic rats.

Product Availability

Flour, oil, seeds, tea

Plant Part Used: Seeds

Dosages

Decongestant

- Adult topical flour poultice: mix 100 g mustard flour with warm water, pack in linen, place on chest 10 min
- Adult topical mustard plaster: mix 4 oz ground black mustard seeds with warm water to make a paste, apply to chest area

Footsoak

- Adult topical seeds: place 1 tbsp seeds in 1000 ml hot water, soak feet 15-20 min

Decongestant

- Child ≥6 yr flour poultice: mix 100 g mustard flour with warm water, pack in linen, place on chest maximum 3-5 min (may cause severe burns, necrosis if left on longer than 15 min)

Contraindications

Class 1 herb (internal); class 2d herb (external, seed).

Until more research is available, mustard should not be used therapeutically during pregnancy and breastfeeding. It should not be given therapeutically to children younger than 6 years of age. Mustard should not be used therapeutically by persons with hypersensitivity to it or by those with renal disorders, gastrointestinal ulcers, or inflammatory kidney diseases. Do not use mustard on unprotected skin. Do not confuse mustard seed with mustard oil.

Side Effects/Adverse Reactions

CNS: Lethargy, *coma*
CV: *Heart failure*
ENDO: Goiter
INTEG: Hypersensitivity reactions, irritation of skin where applied, contact dermatitis
SYST: *Anaphylaxis, angioedema*

Interactions

Drug

Antacids, H_2-blockers, proton pump inhibitors: Mustard may decrease the action of these agents (theoretical) (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Sinigrin		Skin irritant, bacteriostatic
Myrosin		

= Pregnancy = Pediatric = Alert = Popular Herb

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Sinapic acid		
Sinapine		
Fixed oil	Arachic acid; Erucic acid; Eicosenoic acid; Oleic acid; Palmitic acid	
Mucilage		
Globulin		
Volatile oil	Isothiocyanate	Blistering
Protein		

Client Considerations

Assess

- Assess the reason the client is using mustard.
- Assess for hypersensitivity reactions or skin irritation where mustard has been applied. Administer an antihistamine or other appropriate therapy if necessary. Olive oil may be used to soothe skin after removing mustard plaster.

Administer

- Instruct the client not to use mustard for more than 10 minutes (adult), 3-5 min (child) at a time or for longer than 2 weeks.
- Instruct the client to wash hands well with soap and water after use to prevent irritation.
- Instruct the client to store mustard products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use mustard therapeutically in children younger than 6 years of age or in those who are pregnant or breastfeeding until more research is available.
- Advise the client to keep mustard out of reach of children and to avoid applying it around mucous membranes.
- Inform the client that sneezing, coughing, and possible asthmatic attacks can result from breathing the allylisothiocyanate that arises with preparation and application of mustard poultices.
- Teach the client not to confuse mustard seed with mustard oil.

Myrrh

(muhr)

Scientific name: *Commiphora molmol*

Other common names: African myrrh, Arabian myrrh, bal, bol, bola, gum myrrh, heerabol, Somali myrrh, Yemen myrrh

Origin: Myrrh is a shrub found in various regions of Africa.

Uses

Myrrh traditionally has been used internally to treat upper respiratory congestion, pharyngitis, gingivitis, mouth ulcers, stomatitis, leprosy, syphilis, and leg ulcers. Topically, it is used to treat wounds, decubitus ulcers, and hemorrhoids. Contemporary use is mostly limited to flavoring in foods and fragrance in cosmetic products.

Investigational Uses

Researchers are experimenting with the use of myrrh in combination with other products to treat colds and infections.

Actions

Several studies have focused on the actions of myrrh. Myrrh has been found to decrease cholesterol levels, decrease inflammation, provide analgesia, act as an antiulcer and antitumor agent, and stimulate triiodothyronine production.

Antilipidemic Action

When myrrh was studied along with garlic for reduction of cholesterol, triglycerides, and phospholipids, garlic was found to be far superior to myrrh (Dixit et al, 1980). However, when myrrh was studied with *Allium sativum* and *Allium cepa,* all three agents were found to prevent a rise in these three indicators (Lata et al, 1991).

Antiinflammatory and Antipyretic Actions

Three studies have identified the antiinflammatory action of myrrh. One study used laboratory animals that had been injected with liquid paraffin containing killed mycobacterial adjuvant. In this study, phenylbutazone, ibuprofen, and a fraction of myrrh all were shown to provide significant relief of arthritis symptoms (Sharma et al, 1977). The other studies identified a triterpene with antiinflammatory and analgesic properties (Dolara et al, 2000; Fourie et al, 1989). In this study, a significant antiinflammatory effect occurred when myrrh was administered to mice. In another study, an antipyretic action was observed (Tariq et al, 1986).

Anticancer Action

Myrrh's anticancer action has been demonstrated in a study using mice. The study evaluated results at 25 to 50 days. Anticarcinogenic results were less pronounced after 50 days. The effect was comparable to that of cyclophosphamide (Al-Harbi et al, 1994). Another study showed similar results, leading researchers to conclude that the use of myrrh for the treatment of cancer is appropriate (Qureshi et al, 1993).

Product Availability

Capsules, fluid extract, mouthwash, resin, tincture

Plant Parts Used: Gum, oil, resin

Dosages

- Adult PO mouthwash: mix 5-10 drops in glass of water (Blumenthal, 1998)
- Adult PO tea: place 2 tsp 10% powdered resin in 8 oz boiling water, steep 15 min; may be taken tid
- Adult topical tincture: 1-4 ml may be applied to the affected area bid-tid

Contraindications

Pregnancy category is 2; breastfeeding category is 3A.
Myrrh should not be given to children. It should not be used by persons with hypersensitivity to it or by those with fever, severe uterine bleeding, or tachycardia.

Side Effects/Adverse Reactions

CNS: Anxiety, restlessness
GI: Nausea, vomiting, anorexia, diarrhea
INTEG: Hypersensitivity reactions, dermatitis

Interactions

Drug

Antidiabetics: Use of myrrh with antidiabetics may cause increased hypoglycemic effects; avoid concurrent use.

Lab Test

Blood glucose: Myrrh may decrease blood glucose levels (theoretical) (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil	Cadinene; Dipentene; Heerabolene; Limonene; Pinene; Eugenol; Creosol; Cinnamaldehyde; Cumic alcohol; Cuminaldehyde; Myrcene; Alpha-camphorene	
Resin		
Steroid	Cholesterol; Campesterol; Beta-sitosterol	
Terpenoid	Amyrin; Furanosesquiterpenoid	

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of myrrh and administer an antihistamine or other appropriate therapy.
- Assess the client's use of antidiabetics such as insulin. Monitor blood glucose if the client is taking concurrently with myrrh (see Interactions).

Administer

- Instruct the client to store myrrh products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 2 and breastfeeding category is 3A.
- Caution the client not to give myrrh to children.

Myrtle

(muhr'tuhl)

Scientific name: *Myrtus communis*

Other common names: Bridal myrtle, common myrtle, Dutch myrtle, Jew's myrtle, mirth, Roman myrtle

Origin: Myrtle is found in the Middle East and Mediterranean regions.

Uses

Myrtle traditionally has been used to treat respiratory congestion, gastrointestinal conditions, urinary tract infections, whooping cough, tuberculosis, and worm infestations. It is also used topically as an astringent.

Investigational Uses

Initial research is underway to determine the efficacy of myrtle as an antidiabetic.

Actions

Very little research has been done on myrtle, with only one or two research articles at most for any of its actions.

Antihyperglycemic Action

An older study identified the antihyperglycemic action of myrtle on streptozocin-induced diabetic mice (Elfellah et al, 1984). Blood glucose levels dropped significantly after administration of myrtle. No effect was observed on normal blood glucose levels.

Hemagglutinin Action

The phytohemagglutinins in myrtle have been found to be useful in the preparation of laboratory samples. Addition of phytohemagglutinins to the samples clarifies the contents and allows for increased visibility (Ortega et al, 1979).

Antiinflammatory Action

A study on laboratory rats evaluated the antiinflammatory action of myrtle. Rat paws were injected with carrageenan to induce inflammation. When compared with other herbs, *Myrtus communis* was the least effective in the reduction of inflammation (Al-Hindawi et al, 1989).

Other Actions

One toxicology study using laboratory rats identified the toxicity of myrtle after ingestion of the essential oil from the leaves of *Myrtus communis* (Uehleke et al, 1979). Interestingly, the rats were able to adapt to myrtle ingestion after repeat dosing. Infections of *Pseudomonas aeruginosa* are susceptible to myrtle (Al-Saimary et al, 2002). Another study done in the laboratory tested the essential oils of myrtle. The oil was found to have excellent antimicrobial action against *Escherichia coli, Staphylococcus aureus,* and *Candida albicans* (Yadegarinia et al, 2006).

Product Availability

Extract

Plant Parts Used: Leaves, seeds

Dosages

- Adult PO extract: 0.2 g as a single dose

Contraindications

Until more research is available, myrtle should not be used during pregnancy and breastfeeding. It should not be given to children. Myrtle should not be used internally by persons with inflammation of the gastrointestinal tract or hepatic disease. Persons with hypersensitivity to this herb should not use it. Clients with diabetes mellitus should use myrtle cautiously.

Side Effects/Adverse Reactions

ENDO: Hypoglycemia
GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions
SYST: Facial contact: *glottal/bronchial spasm, asthma-like attacks, respiratory failure in infants and children* (Jellin et al, 2008)

Interactions

Drug

Antidiabetics: Use of myrtle with antidiabetics such as insulin may cause increased hypoglycemia; do not use concurrently.
Cytochrome P450: Concurrent use of myrtle with drugs metabolized by cytochrome P450 should be avoided.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil	Myrtol; Gelomytrol; Eucalyptol; Pinene; Camphor; Cineol; Myrtenylacetate; Limonene; Alpha-terpineol; Geraniol	Simulates mucous membranes, antioxidant, antibacterial
Tannin		Wound healing; astringent
Acylphloroglucinols	Myrtucommulone A	Antibacterial

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of myrtle and administer an antihistamine or other appropriate therapy.
- Monitor blood glucose levels in diabetic clients who are taking antidiabetics concurrently with myrtle (see Interactions).
- Monitor hepatic function tests (ALT, AST, bilirubin). If results are elevated, use of myrtle should be discontinued.

Administer

- Instruct the client to store myrtle products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use myrtle in children or those who are pregnant or breastfeeding until more research is available.
- Advise the client to use the essential oil only under the direction of a qualified herbalist. Overdoses can lead to life-threatening poisoning resulting from high cineol content.

Neem

(neem)

Scientific name: *Azadirachta indica*

Other common names: Bead Tree, Holy Tree, Indian Lilac, Margosa, Nim, Nimba, Persian Lilac, Pride of China

Origin: Neem is an evergreen found in India.

Uses

Neem traditionally has been used as an anthelmintic and to treat malaria and diabetes mellitus. It has also been used topically to treat skin conditions. Neem has been used intravaginally as a contraceptive. It is an antiinflammatory and antipyretic.

Investigational Uses

Researchers are experimenting with the use of neem as a contraceptive and an antiinfective.

Actions

Several research articles have focused on the actions of neem. Proposed actions include antimalarial, antifertility, immunomodulatory, hypotensive, antiinflammatory, antihyperglycemic, anxiolytic, hepatoprotective, and antimicrobial.

Hepatoprotective, Gastroprotective Action

Hepatotoxicity was induced in rats by using paracetamol. Administration of *Azadirachta indica* significantly reduced hepatic toxicity as measured by AST, ALT, and histopathologic study of the liver (Bhanwra et al, 2000). One study (Bandyopadhyay et al, 2002) identified the gastroprotective effect of neem including control of hyperacidity and ulcer.

Hypoglycemic Action

In a study, diabetic rabbits were given neem leaf extract and seeds. Blood glucose levels were significantly reduced at the end of 4 weeks (Khosla et al, 2000). When neem was started 2 weeks before the rabbits were diabetically induced, diabetes was partially prevented. This information may be useful for the prevention of, or to delay the onset of, the disease. Another study using rats showed the inhibition of serotonin on insulin secretion that is mediated by glucose (Chattopadhyay et al, 1999). The leaf extract significantly decreased hyperglycemia.

Antimicrobial and Antimalarial Actions

Neem leaf extract was evaluated for its effects against coxsackievirus B. In an in vitro study of African green monkeys, coxsackie 4 virus was significantly inhibited at levels of 1000 mcg/ml at 96 hours (Badam et al, 1999). Another study identified antiplaque, anticaries, and antimicrobial effects of the neem chewing sticks called Miswak that are used in the Middle East and on the Indian subcontinent (Almas, 1999). The effects were evaluated using blood agar and other methods up to 48 hours after chewing of the sticks. Neem was found to be effective against *Streptococcus mutans* and *Streptococcus faecalis*. A study evaluating the antimalarial action of neem found that the herb is effective even against parasites that are resistant to other antimalarial agents (Dhar et al, 1998).

Immunomodulatory Anticancer Action

Immune response was evaluated in laboratory mice and found to be increased after the use of neem. This information corroborates the use of neem for the treatment of many infectious and noninfectious conditions (Nijiro et al, 1999). Another study

(Ganger et al, 2006) found neem's leaf extract to be chemoprotective against stomach tumors in mice. There was also a lack of toxicity.

Antifertility Action

Several studies have dealt with the antifertility properties of neem. One study using rats evaluated the effect of neem leaves on the seminal vesicles and ventral prostate. After various oral doses were administered for 24 days, investigators observed a decrease in the weights of the seminal vesicles and ventral prostate. These results suggest that neem exerts an antiandrogenic action (Aladakatti et al, 2001; Kasutri et al, 1997). Another study evaluated the occurrence of spontaneous abortion in primates given neem (Mukherjee et al, 1996). Neem seed extract was given orally for 6 days after pregnancy was confirmed. Termination of pregnancy occurred, as evidenced by a decline in progesterone and chorionic gonadotropin.

Product Availability

Tincture

Plant Parts Used: Above-ground parts

Dosages

No dosage consensus exists for PO tincture or topical routes.

Contraindications

Until more research is available, neem should not be used during pregnancy and breastfeeding. It should not be given to children. Infants have died after ingesting neem oil. Persons with hypersensitivity to neem should not use it.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions
SYST: *Reye's-like symptoms (infants)*

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Triterpenoid	Nimocinol; Meliacinol (Siddiqui et al, 2000)	Insecticide
	Odoratone; Trihydroxypregnan; Diacetoxyapotirucall	
Mahmoodin	Antibacterial	
	Gedunin; Nimbolide	Antimalarial
	Azadirone; Epoxyazadiradione; Nimbin; Azadiradione; Deacetylnimbin; Hydroxyazadiradione	
Limonoid	Deoxonimbolide	Antitumor
	Naheedin	

= Pregnancy = Pediatric = Alert = Popular Herb

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of neem and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store neem in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use neem in children or those who are pregnant or breast-feeding until more research is available.
- Advise the client that infants have died after ingesting neem oil.

Nettle

(neh′tuhl)

Scientific name: *Urtica dioica*

Other common names: Common nettle, greater nettle, ortie, stinging nettle, urtica

Origin: Nettle is a perennial found in Europe, the United States, and Canada.

Uses

Nettle traditionally has been used as a tea to treat cough, tuberculosis, and other respiratory conditions, including allergic rhinitis. It is used as an expectorant, an astringent, a diuretic, and as a treatment for urinary tract disorders. Nettle is recognized as a bladder irrigant to reduce blood loss and inflammation in bladder conditions; benign prostatic hypertrophy (BPH) (root only). Nettle is also used for arthritis pain, often in conjunction with low doses of NSAIDs. It is used externally as a hair and scalp remedy for oily hair and dandruff.

Investigational Uses

Nettle may be used as a diuretic; to lower blood pressure; and for prostate cancer.

Actions

Benign Prostatic Hyperplasia (BPH) Action

Many studies have been performed to confirm the BPH action of nettle. Several double-blind controlled studies showed a considerable improvement in urologic function after nettle was given. The change in urination occurred within 4 weeks to 6 months, depending on the study.

Anticancer Action

One study has shown that the use of stinging nettle root extract slows the progression of prostate cancer (Konrad et al, 2000). The rate of slowing observed was statistically significant.

Analgesic and Antiinflammatory Actions

In a study, nettle was shown to be an effective and inexpensive treatment for joint pain (Randall et al, 1999). In another study with similar results (Riehemann et al, 1999), nettle decreased the inflammation associated with rheumatoid arthritis.

Other Actions

Nettle was found to possess diuretic and hypotensive effects when a continuous perfusion of the aqueous extract was administered to rats (Tahri et al, 2000).

Product Availability

Capsules, dried leaves, root extract, root tincture

Plant Parts Used: Leaves, roots, stems

Dosages

- Adult PO capsules: 150-300 mg daily
- Adult PO tea: place 2 tsp dried leaves in 8 oz boiling water, steep 15 min; may be taken bid
- Adult PO tincture: ½-1 tsp daily-bid

Osteoarthritis

- Adult PO crude stinging nettle leaf: 9 g daily (Jellin et al, 2008)

Allergic rhinitis

- Adult PO extract: 300 mg tid (Jellin et al, 2008)

Contraindications

Pregnancy category is 3; breastfeeding category is 2A.

Nettle should not be given to children younger than 2 years of age. Caution should be used when giving nettle to older children and geriatric clients. Persons with hypersensitivity to nettle should not use it.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, diarrhea, gastrointestinal irritation
INTEG: Hypersensitivity reactions, urticaria
MISC: Oliguria, edema

Interactions

Drug

Anticoagulants *(heparin, warfarin):* Nettle may decrease the effect of anticoagulants; avoid concurrent use.
CNS depressants *(alcohol, barbiturates, sedative/hypnotics, antipsychotics, opiates):* Nettle may lead to increased central nervous system depression.
Diuretics: Use of nettle may increase the effects of diuretics, resulting in dehydration and hypokalemia; avoid concurrent use.
Iron salts: Nettle tea may interfere with the absorption of iron salts.
Lithium: Nettle combined with lithium may result in dehydration, lithium toxicity.

Herb

Anticoagulant herbs: Nettle with anticoagulant herbs may decrease anticoagulation.
Sedative herbs: Nettle may increase central nervous system depression in sedative herbs.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Scopoletin Glucoside		Antiinflammatory
Flavonoid	Rutin	
Amine	Choline; Histamine; Serotonin; Formic acid	
Volatile oil	Ketones	
Potassium ion		
Pygeum Beta-sitosterol (root)		Improves benign prostatic hypertrophy

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of nettle and administer an antihistamine or other appropriate therapy.

Administer

- Recommend that the client increase his or her intake of potassium-containing foods to prevent hypokalemia.
- Instruct the client to store nettle products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 2A.
- Caution the client not to give nettle to children younger than 2 years of age, and to use caution when giving nettle to older children and geriatric clients.
- Advise the client to use nettle as a urinary tract irrigant only under the supervision of a qualified herbalist.
- Inform the client that stinging and burning will result if the plant is touched.

New Zealand Green-Lipped Mussel

(new zee'luhnd green lipt muh'suhl)

Scientific name: *Perna canaliculus*

Other common name: NZGLM

Origin: New Zealand green-lipped mussel is a mollusk.

Uses

New Zealand green-lipped mussel may be used to decrease inflammation and as a treatment for osteoarthritis and rheumatoid arthritis.

Actions

Antiinflammatory Action

Several studies have evaluated the antiinflammatory action of New Zealand green-lipped mussel. All have shown similar results, with significant antiinflammatory effects documented (Caughey et al, 1983; Couch et al, 1982; Halpern, 2000; Miller et al, 1980, 1993). These studies used various experimental models. Other studies (Lawson et al, 2007; Mani et al, 2006) identified the increase in cytokines with significant reduction in disease incidence, onset, and severity of rheumatoid arthritis in rats.

Other Actions

One study (Emelyanov et al, 2002) identified the positive outcome when New Zealand green-lipped mussel is used for asthma. Since asthma is an inflammatory condition, it was considered appropriate for development of this research model.

Product Availability

Capsule

Plant Part Used: Whole mussel

Dosages

- Adult PO extract: 300-350 mg tid (Jellin et al, 2008)

Contraindications

Until more research is available, New Zealand green-lipped mussel should not be used during pregnancy and breastfeeding. It should not be given to children. Persons with hypersensitivity to shellfish should not use New Zealand green-lipped mussel.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of New Zealand green-lipped mussel and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store New Zealand green-lipped mussel products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use New Zealand green-lipped mussel in children or in those who are pregnant or breastfeeding until more research is available.

Night-Blooming Cereus

(nite blew'ming si'ree-uhs)

Scientific name: *Selenicereus grandiflorus*

Other common names: Large-flowered cactus, queen of the night, sweet-scented cactus, vanilla cactus

Origin: Night-blooming cereus is found in the tropics of North America.

= Pregnancy = Pediatric = Alert = Popular Herb

Uses

Night-blooming cereus has been used to treat palpitations, dysmenorrhea, menorrhagia, shortness of breath; cardiac conditions such as angina pectoris, endocarditis; myocarditis, and urinary tract disorders such as cystitis, irritable bladder, and edema. Other disorders include hyperthyroidism and benign prostatic hypertrophy. Topically, night-blooming cereus may be used for rheumatism.

Actions

Very little research is available for night-blooming cereus, and results of existing studies are inconclusive (Hapke, 1995; Wadworth et al, 1992). However, two of its chemical components, cactine and hordenine, are known to be cardiac glycosides.

Product Availability

Fluid extract, tincture, cream

Plant Parts Used: Flowers, stems, young shoots

Dosages

- Adult PO fluid extract (1:1): 0.6 ml 1–10 times/day
- Adult PO tincture (1:10): 0.12-2 ml bid-tid
- Adult topical: rub into affected area as needed

Contraindications

Class 1 herb (flower, stem).

Until more research is available, night-blooming cereus should not be used during pregnancy or breastfeeding. Persons with hypertension, severe cardiac disorders, or hypersensitivity to this plant should not use it.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, diarrhea, stinging or burning in the oral cavity

INTEG: Hypersensitivity reactions; rash (topical)

Interactions

Drug

Cardiac glycosides: Night-blooming cereus may increase the actions of cardiac glycosides such as digoxin and digitoxin; avoid concurrent use.

MAOIs: Use of MAOIs may increase the cardiac effects of night-blooming cereus; avoid concurrent use. Since tyramine is present in night-blooming cereus, this herb should be avoided with MAOIs (theoretical).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Glycoside	Cactine; Hordenine	Cardiac glycoside
Flavonoid	Kaempferitrin; Rutin	Improved capillary function, dilatation
	Narcissin; Cacticine; *N*-methyl tyramine	

Continued

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Betacyan **Betacyanin** **Narcissin** **Grandiflorine** **Hyperoside** **Isorhamnetin**	Rutinoside	Improved capillary function

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of night-blooming cereus and administer an antihistamine or other appropriate therapy.
- Assess the cardiac client for the use of MAOIs or cardiac drugs; recommend that the client avoid concurrent use of night-blooming cereus with these products (see Interactions).
- Monitor heart rate, rhythm, and character.

Administer

- Instruct the client to store night-blooming cereus products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use night-blooming cereus in those who are pregnant or breastfeeding until more research is available.

Nutmeg

(nuht'mayg)

Scientific name: *Myristica fragrans, M. officinalis*

Other common names: Jaatipatree, jaiphal, jatipatra, jetikosha, mace, macis, muscadier, muskatbaum, myristica, noz moscada, nuez moscada, nux moschata

Origin: Nutmeg is a tree found in the West Indies and Sri Lanka.

Uses

Nutmeg has been used traditionally for anxiety, depression, toothache, nausea, chronic diarrhea, joint pain, and for gastrointestinal disorders such as gastritis and indigestion. It is also used as an antiemetic, an aphrodisiac, to induce abortion, and to increase menstrual flow. Nutmeg is used as a spice in food.

Investigational Uses

Research is underway for nutmeg's use as an antimicrobial, anticancer, and anxiogenic.

Actions

Nutmeg has been studied for its antimicrobial, antiinflammatory, analgesic, antithrombotic, hypolipidemic, and chemoprotective properties. However, many of these proposed actions are documented by only one study each.

Antimicrobial Actions

Two chemical components of nutmeg known as malabaricones B and C, which are classified as resorcinols, showed powerful antifungal and antibacterial effects when the dried seed covers were evaluated (Orabi et al, 1991). The volatile oils of several herbs were tested for antibacterial action against 25 types of bacteria. The herbs studied were cloves, black pepper, nutmeg, geranium, oregano, and thyme, and the bacteria tested came from food spoilage, food poisoning, animal pathogens, and plant pathogens. All of the herbs that were tested showed powerful antibacterial effects (Dorman et al, 2000).

Antiinflammatory, Analgesic, and Antithrombic Actions

A chloroform extract of nutmeg was tested in laboratory rodents. The extract was found to decrease pain in mice and also protect against induced thrombosis (Olajide, 1999). Another study evaluated the antiinflammatory effects of nutmeg by using rats and mice with carrageenan-induced paw edema and acetic acid-induced valcular permeability. At the conclusion of the study, researchers believed myristicin to be the chemical component responsible for the antiinflammatory effect (Ozaki et al, 1989). An older study showed the analgesic effect of nutmeg on young chickens (Sherry et al, 1982). An extract of nutmeg was shown to increase both light and deep sleep in these chickens. Anxiogenic activity was identified in nutmeg. The study used mice and several maze-related activities (Sonavane et al, 2002).

Hypolipidemic Action

In a study of hyperlipidemic rabbits, six rabbits received fluid extract of nutmeg for 60 days at a dose of 500 mg/kg, with the remainder of the rabbits used as the control group. Significantly lower cholesterol levels were found in the hearts and livers of the experimental group, along with platelet antiaggregatory ability (Ram et al, 1996). Another study using rabbits showed that nutmeg decreased total cholesterol, reduced low-density lipoprotein (LDL) cholesterol, lowered the cholesterol/phospholipid ratio, and increased the high-density lipoprotein (HDL) ratio by significant levels (Sharma et al, 1995).

Chemoprotective Action

In a study of young mice with induced cancer of the uterine cervix, administration of oral *Myristica fragrans* resulted in a significant reduction of the cancer, with precancerous lesions unaffected (Hussain et al, 1991). In another study using mice, papilloma was induced before nutmeg was fed to the mice. A significant reduction in papilloma (50%) occurred (Jannu et al, 1991). Chirathaworn et al (2007) used the methanolic extract of nutmeg; there was a decrease in Jurkat leukemia T-cell line when tested in the laboratory.

Product Availability

Capsules, essential oil, powder

Plant Part Used: Dried seeds

Dosages

Gastrointestinal Disorders

- Adult PO capsules: 2 caps as a one-time dose
- Adult PO essential oil: 4-5 drops on a sugar cube
- Adult PO powder: 4-6 tbsp daily

Antiflatulent
- Adult PO oil: 0.3 ml

Diarrhea
- Adult PO powder: 4-6 tbsp daily (Jellin et al, 2008)

Toothache
- Adult topical essential oil: 1-2 drops applied to gums (Jellin et al, 2008)

Contraindications

Class 2b herb (seeds, aril).

Because it can cause spontaneous abortion, nutmeg should not be used therapeutically during pregnancy. Until more research is available, nutmeg should not be used therapeutically during breastfeeding and should not be given therapeutically to children (in doses higher than that found in food). Nutmeg should not be used therapeutically by persons with hypersensitivity to it, and it should be used with caution by persons with major depression and those with anxiety disorders.

Side Effects/Adverse Reactions

CNS: Confusion, stupor, *seizures, death*
GI: Nausea, vomiting, anorexia, constipation, dry mouth
GU: *Spontaneous abortion*
INTEG: Hypersensitivity reactions

Interactions

Drug

Antidiarrheals: Antidiarrheals may be potentiated by nutmeg; monitor for constipation.
Cytochrome P450 1A1, 1A2, 2B1, 2B2 substrates: Nutmeg may alter drugs metabolized by these enzyme systems (theoretical) (Jellin et al, 2008).
MAOIs, psychotropic agents: MAOIs may be potentiated by nutmeg, psychotropic agents; avoid concurrent use.

Herb

Safrole herbs: Nutmeg with safrole herbs increases risk for toxicity (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Fixed oil	Myristic acid; Tridecanoic acid; Lauric acid; Stearic acid; Palmitic acid	
Essential oil	Eugenol; Isoeugenol; Iso-elemicin; Gerianiol; D-pinene; L-pinene; Borneol; Safrole; Limonene; Sabinene; Lysergide	
Resorcinol	Malabaricone B, C	Antimicrobial
Neolignans	A, B, C, dehydroiisoeugenol (Juhasz et al, 2000)	

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of nutmeg and administer an antihistamine or other appropriate therapy.
- Assess for the use of antidiarrheals, MAOIs, and psychotropic agents (see Interactions).
- Monitor for central nervous system effects (confusion, stupor, seizures); if these occur, discontinue the use of nutmeg and institute supportive measures. Monitor for changes in bowel pattern (constipation).

Administer

- Warn the client that nutmeg is toxic in large doses.
- Instruct the client to store nutmeg products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use nutmeg therapeutically during pregnancy because it can cause spontaneous abortion. Until more research is available, caution the client not to use nutmeg therapeutically during breastfeeding and not to give it therapeutically to children.
- Advise the client to report central nervous system effects and changes in bowel pattern.
- Caution the client that nutmeg is toxic in large doses. Do not increase the dose, and keep nutmeg out of the reach of children.
- Advise the client not to perform hazardous activities such as driving or operating heavy machinery until physical response to the herb can be evaluated.
- Caution the client not to use nutmeg with psychoactive drugs (see Interactions).

Oak

(oek)

Scientific names: *Quercus robur, Quercus petraea, Quercus alba*

Other common names: Black oak, British oak, brown oak, common oak, cortex quercus, dusmast oak, ecorce de chene, eichenlohe, eicherinde, encina, English oak, gravellier, nutgall, oak apples, oak bark, oak galls, pedunculate oak, sessile oak, stone oak, tanner's bark, white oak, white oak bark

Origin: Oak is a tree found in North America, Australia, Europe, and Asia.

Uses

Oak bark traditionally has been used for its antiinflammatory and astringent properties. Topically, oak is used to treat skin disorders such as psoriasis, eczema, and contact dermatitis. It has also been used as a gargle and to treat varicose veins, hemorrhoids, and burns. Oak is used internally for diarrhea, colds, bronchitis, to stimulate appetite and improve digestion.

Actions

Very little information is available for oak. Its proposed actions include antioxidant, antibacterial, and urolithiasis inhibitor. In one toxicology study evaluating cattle with weakness, diarrhea, and dehydration, one autopsy revealed nephritis and ulceration between the caecum and colon (Neser et al, 1982).

Antioxidant Action

One study focused on the antioxidant action of oak (Masaki et al, 1995). When oak and several other herbs were tested for scavenging activity, its antioxidant properties did not prove significant.

Antibacterial and Urolithiasis Inhibitor Actions

One study of 97 patients with urolithiasis evaluated the ability of oak to inhibit the formation of calculi (Mandana et al, 1980). Study participants were given doses of 1350 mg/day of oak extract. After 8-225 days the kidney stones were significantly decreased. Researchers also observed an inhibition of bacteria proliferation.

Product Availability

Capsules, decoction, extract, gall, ointment, ooze, powder, tincture

Plant Parts Used: Bark, gall

Dosages

- Adult PO: 3 g daily (Blumenthal, 1998)
- Adult PO: 1 oz bark in quart of water, boiled down to a pint and taken up to 3 times/day for 3-4 days (diarrhea)
- Adult rinse/compress/gargle: 20 g/1 L water (Blumenthal, 1998)
- Adult topical ointment: apply prn to affected area
- Adult topical powder (bath): 5 g powder/1 L water (Blumenthal, 1998)

Contraindications

Class 2d herb (bark).

Until more research is available, oak should not be used during pregnancy and breastfeeding. It should not be given to children. Oak should not be used by

Contraindications—cont'd

persons with hypersensitivity to it and should not be used topically on large areas of damaged skin. It should not be taken internally in renal/hepatic/cardiac disease or those with eczema. Oak bark baths are contraindicated in those with hypertonia or infectious diseases. Use cautiously in those with peanut allergies.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, *hepatotoxicity*
GU: *Nephrotoxicity*
INTEG: Hypersensitivity reactions

Interactions

Drug

Iron salts: Oak bark tea may decrease the absorption of iron salts.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Tannin	Pedunculagin	Antisecretory; astringent
	Vescalagin; Castalagin; Mongolicanin (bark)	
Flavonoid	Acutissimin A, B; Eugenigrandin A; Guajavin B; Stenophyllanin C	
Calcium oxalate		

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of oak and administer an antihistamine or other appropriate therapy.
- Assess for renal/hepatic disease if oak is to be taken internally; kidney damage and necrotic liver conditions can result.

Administer

- Instruct the client to store oak in a cool, dry place, away from heat and moisture.
- Do not administer PO in large amounts; kidney damage and necrotic liver conditions can result.
- Large amounts may be carcinogenic.

Teach Client/Family

- Caution the client not to use oak in children or those who are pregnant or breastfeeding until more research is available.

Oats

(oetz)

Scientific name: *Avena sativa*

Other common names: Groats, haver, haver-corn, haws, oat bran, oat grass, oat straw, oatmeal, wild oats

Origin: Oats come from a grain found in North America, Russia, and Germany.

Uses

Traditionally, oats have been used topically to relieve the itching and irritation of various skin disorders. Taken internally, oats may have sedative properties and are used for gallstones, bowel diseases, hypertension, constipation, fatigue, flu, coughs, bladder/rheumatic disorders, preventing colon/gastric cancer, and lowering uric acid levels.

Investigational Uses

Oats are being researched for their antilipidemic, anticholesterol, and antidiabetic effects. Oat green tea may be effective in the treatment of drug, alcohol, and smoking addiction.

Actions

Anticholesterol Action

Most of the research on oats has focused on the anticholesterol effect of oat bran. The bran fiber binds to cholesterol and bile components, thus removing them from the body when the fiber is excreted.

Antioxidant Action

Oats may possess antioxidant properties. Several components in the enrichment process are antioxidants (Emmons et al, 1999).

Antiaddiction Action

One study has shown that the use of oat tincture can decrease the nicotine cravings of smokers, as well as the pressor effect that occurs when nicotine is administered intravenously (Connor et al, 1975). In another study, 100 smokers with an average consumption of 20 cigarettes a day were treated with an extract of *Avena sativa* for the purpose of disaccustoming them to nicotine. The light smokers showed a positive result, whereas the heavy smokers did not (Schmidt et al, 1976).

Product Availability

Bath products, cereal, lotion, powder, tablets, tea, wafers, whole grain

Plant Part Used: Grain

Dosages

Skin Irritation

- Adult topical: apply prn
- Adult topical (bath): 100 g cut herb/full bathtub of water

To Lower Cholesterol Levels

- Adult PO whole oats: 50-150 g daily

Type 2 Diabetes

- Adult PO: 25 g whole oats daily

Contraindications

Class 1 herb (spikelets).
Oats should not be used by persons with intestinal obstruction, celiac disease, or strangulated bowel.

Side Effects/Adverse Reactions

GI: Bloating, flatus
INTEG: Hypersensitivity reactions, contact dermatitis

Interactions

Drug

Morphine: Oats may decrease the effect of morphine; do not use concurrently.
Nicotine: Oats may decrease the hypertensive effect of nicotine.
Oral medications: Oats may decrease absorption of oral medications; separate by 1 hour before or 4 hours after oats (Jellin et al, 2008).

Lab Test

Blood glucose, cholesterol: Oats decrease these tests; inaccurate results may occur.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Saponin	Triterpenoid Furostandl	Fungicidal
Carotenoid		
Polyphenol		
Monosaccharide		
Oligosaccharide		
Gluten		
Mineral	Iron; Manganese; Zinc	
Fiber		Anticholesterol
Cellulose		

Client Considerations

Assess

- Assess for hypersensitivity reactions (rare) and for contact dermatitis from oat flour. If these are present, discontinue the use of oats and administer an antihistamine or other appropriate therapy.
- Assess for morphine use (see Interactions).

Administer

- Instruct the client to store oats in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client with bowel obstruction, strangulated bowel, or celiac disease not to use oats.
- Advise the client who is using oats to decrease cholesterol to make other prescribed lifestyle changes as well.
- Inform the client that bowel function may change and flatus may occur.

Octacosanol

(ahk-tuh-kah'suhn-awl)

Scientific names: Sources include *Eupolyphaga sinensis, Acacia modesta, Serenoa repens,* and others

Other common names: 1-octacosanol, 14c-octacosanol, hexacosanol, n-octacosanol, octacosyl alcohol, policosanol, tetracosanol, triacontanol

Origin: Octacosanol is developed from wheat germ, sugar cane, or vegetable waxes.

Uses

Octacosanol is used for herpes infection, treating inflammatory skin diseases, and increasing athletic performance. It may be effective in brain reactivity and to increase cholinergic activity.

Investigational Uses

Researchers are experimenting with the use of octacosanol to treat Parkinson's disease, amyotrophic lateral sclerosis (ALS), hyperlipidemia, and intermittent claudication.

Actions

Hyperlipidemia Action

There have been several studies on the use of octacosanol for use in hyperlipidemia. One study evaluated its use in lipid metabolism. When rats who were fed a high-fat diet were given octacosanol, triglycerides were reduced significantly and serum fatty acids were increased (Kato et al, 1995). There have been several studies that confirmed the improvement in total and LDL cholesterol levels, as well as LDL/HDL ratios. All of these studies were double-blind placebo-controlled trials (Castano et al, 2000; Mas et al, 1999). In a study using octacosanol to treat ALS, no improvement was observed (Norris et al, 1986).

Product Availability

Capsules, tablets

Plant Parts Used: Octacosanol is isolated from several different plants.

Dosages

PO Dosages

- Adult capsules/tablets: 40-80 mg daily

Parkinson's Disease

- Adult PO: 5 mg tid with meals (Jellin et al, 2008)

ALS

- Adult PO: 40 mg/day (Jellin et al, 2008)

Contraindications

Until more research is available, octacosanol should not be used during pregnancy and breastfeeding. It should not be given to children. Parkinson's disease may worsen if client is also taking levodopa or carbidopa (Jellin et al, 2008).

Side Effects/Adverse Reactions

CNS: Dyskinesia, restlessness, nervousness, dizziness
CV: Orthostatic hypotension
GI: Nausea, vomiting, anorexia

Interactions

Drug

Carbidopa/levodopa: Octacosanol may cause dyskinesia when used with carbidopa/levodopa; avoid concurrent use.

Lab Test

Creatine phosphokinase, glucose, lipids, hepatic function tests, serum creatine: Octacosanol interferes with these tests.

Client Considerations

Assess

- Assess clients with Parkinson's disease for increased dyskinesia if taking carbidopa/levodopa concurrently with octacosanol (see Interactions).

Administer

- Instruct the client to store octacosanol in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use octacosanol in children or those who are pregnant or breastfeeding until more research is available.
- Advise the client that research is lacking to support any use of octacosanol.

Oleander ◆

(oe'lee-an-duhr)

Scientific names: *Nerium oleander, Nerium odoratum*

Other common names: Adelfa, laurier rose, rosa francesa, rosa laurel, rose bay

Origin: Oleander is a shrub found in the southern United States, Indonesia, and the Mediterranean region.

Uses

Traditionally, oleander has been used to treat cardiac disease, diuresis, and menstrual irregularities. It has also been used as a laxative, an insecticide, an abortifacient, a parasiticide, and for ringworm. In some countries oleander is used internally as an anthelmintic, and topically to treat warts and other skin disorders.

Investigational Uses

New studies have shown a use for oleander in cancer.

Actions

Many of the chemical components of oleander are cardiac glycosides (see table). Several studies have investigated the digoxin-like toxicity of this plant. One such study focused on the toxicity of oleander in a guinea pig that experienced seizures and cardiac symptoms after eating dried oleander leaves (Kirsch, 1997). The guinea pig was released after undergoing intensive care for 24 hours. Another study reported complete atrioventricular block in a 33-year-old woman who was

self-medicating with oleander (Nishioka et al, 1995). A third report focused on a 38-year-old woman with poisoning after ingesting oleander leaves. Her symptoms included those of digitalis intoxication. Use of digoxin-specific FAB proved successful (Romano et al, 1990) in the treatment of the toxicity, as well as in another reported case of oleander poisoning (Shumaik et al, 1988). One study (Pathak et al, 2000) showed human cancer cell death but not murine cancer cell death. Different concentrations of oleander were used. Canine oral cancer cells treated showed immediate response.

Product Availability

Extract, tincture

Plant Part Used: Leaves

Dosages

No published dosages are available.

Contraindications

Because it can cause spontaneous abortion, oleander should not be used during pregnancy. Until more research is available, this herb should not be used during breastfeeding and should not be given to children. Persons with hypersensitivity to oleander should not use it. Because of the toxic nature of this plant, oleander is not recommended for any use. Oleander should not be used with electrolyte imbalance or heart disease.

Side Effects/Adverse Reactions

CNS: Depression, dizziness, stupor, headache
CV: *Dysrhythmias, ventricular ectopy, bradycardia, CV collapse, death*
GI: Nausea, vomiting, anorexia, abdominal cramps
GU: *Spontaneous abortion*
INTEG: Hypersensitivity reactions, contact dermatitis
META: Hyperkalemia, peripheral neuritis
RESP: Tachypnea

Interactions

Drug

Calcium: Calcium may increase the action of oleander (Jellin et al, 2008).
Cardiac glycosides *(digoxin):* Use of oleander with cardiac glycosides may cause fatal digitalis toxicity; do not use concurrently.
Diuretics, macrolide antiinfectives, quinine, stimulant laxatives: Oleander with these agents may increase cardiac glycoside toxicity (theoretical) (Jellin et al, 2008).

Herb

Cardiac glycoside herbs: Oleander with cardiac glycoside herbs is contraindicated (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Glycoside	Nerioside; Oleandrin; Neriin; Oleandroside; Digitoxigenin; Gentiobiosyl-oleandrin; Odoroside A	Cardiac glycoside
	Glucosyl-oleandrin	
Folinerin		
Rosagenin		
Rutin		
Cornerine		
Oleandromycin		

Client Considerations

Assess

- Assess for hypersensitivity reactions and contact dermatitis. If present, discontinue the use of oleander and administer an antihistamine or other appropriate therapy.
- Assess for the use of cardiac glycosides. Fatal digitalis toxicity can result from concurrent use (see Interactions).

Administer

- Instruct the client to store oleander in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use oleander during pregnancy because it can cause spontaneous abortion. Until more research is available, caution the client not to use this herb during breastfeeding and not to give it to children.
- Advise the client that oleander is extremely toxic and should not be used except under the supervision of a qualified herbalist. All plant parts are potentially dangerous.

O

Oregano

(uh-reh'guh-noe)

Scientific names: *Origanum vulgare, Panax quinquefolis*

Other common names: Mountain mint, origanum

Origin: Oregano is found throughout Asia, Europe, and northern Africa. It is cultivated throughout the world, including the United States.

Uses

Oregano is best known for its use as a food flavoring used in cooking. Therapeutically, oregano is used internally as an expectorant, as an insect repellent, for athlete's foot, insect bites, intestine disorders such as dyspepsia and intestinal parasites, and

to treat respiratory disorders, cough, and bronchial catarrh. It has also been used as a systemic tonic and diaphoretic, as well as to treat menstrual irregularities. Topically, oregano is used to treat infection. It may also be added to shampoo for its antiseptic action.

Investigational Uses

Initial research supports the use of oregano as an antibacterial, antifungal, and antioxidant.

Actions

Little information is available on the actions of oregano. Proposed actions include antioxidant, antibacterial, and antifungal.

Antioxidant Action

Oregano is high in tocopherols, which are responsible for its antioxidant action (Lagouri et al, 1996). Another study (Nakatani, 2000) identified phenolic antioxidants from several herbs and spices. One of the herbs studied was *Origanum vulgare.*

Antibacterial and Antifungal Actions

Several herbs were evaluated to determine the antibacterial effects of their volatile oils. The volatile oils of black pepper, cloves, geranium, nutmeg, oregano, and thyme all showed significant antibacterial action against the 25 bacteria species tested (Dorman et al, 2000). Inhibition of *Aspergillus* was evaluated using the essential oils of oregano, mint, basil, sage, and coriander. Oregano and mint completely inhibited the growth of *Aspergillus,* whereas sage and coriander showed no inhibitory effects. Basil was only slightly effective (Basilico et al, 1999).

Product Availability

Capsules, dried herb, oil

Plant Parts Used: Above-ground parts (dried)

Dosages

- Adult PO capsules: 2 caps daily-bid with meals
- Adult PO dried herb tea: pour 250 ml boiling water over 1 tsp dried herb, let stand 10 min, strain
- Adult PO oil: 5 drops added to liquid
- Adult topical oil: apply to affected area prn as an antiseptic

Intestinal Parasites

- Adult PO emulsified oil: 200 mg tid × 6 wk (Jellin et al, 2008)

Contraindications

Class 1 herb (leaf).

Until more research is available, oregano should not be used therapeutically during pregnancy and breastfeeding. It should not be given therapeutically to children. Oregano should not be used therapeutically by persons with hypersensitivity to this herb or other members of the Lamiaceae family, such as mint, sage, marjoram, thyme, basil, lavender, or hyssop.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia (large amounts)

INTEG: Hypersensitivity reactions—facial edema, itching, dysphagia, dysphonia, *inability to breathe*

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Tannin		Wound healing; astringent
Acid	Gallic acid	
Tocopherol	Alpha; Beta; Gamma; Delta	Antioxidant
Volatile oil	Carvacrol; Gamma-terpinene; P-cymene; Thymol	

Client Considerations

Assess

- Assess for hypersensitivity reactions (facial edema, itching, inability to breathe, dysphonia, dysphagia). If present, discontinue the use of oregano and administer an antihistamine or other appropriate therapy. If the client is allergic to other herbs in the Lamiaceae family (basil, marjoram, lavender, hyssop, mint, sage), cross-sensitivity may occur.

Administer

- Instruct the clients to store oregano products in a sealed container away from heat and moisture.

Teach Client/Family

- Caution the client not to use oregano therapeutically in children or those who are pregnant or breastfeeding until more research is available.
- Caution the client not to confuse oregano with marjoram *(Origanum marjorana)*.
- Because cross-sensitivity is possible, advise the client who is allergic to other plants of the Labiatae family (thyme, hyssop, basil, marjoram, mint, sage, and lavender) not to use oregano (Benito et al, 1996).

Oregon Grape

(aw′ri-guhn grayp)

Scientific name: *Mahonia aquifolium*

Other common names: Blue barberry, creeping barberry, holly-leaved barberry, mountain grape

Origin: Oregon grape is a shrub found in the western region of the United States.

Uses

Different forms of Oregon grape have different uses. The tincture is used to treat skin disorders such as eczema, psoriasis, dandruff, herpes, and acne, as well as hepatitis, upper-respiratory congestion, sexually transmitted diseases, arthritis, and other joint disorders. The root bark is used to treat diarrhea, fever, gallbladder conditions, renal calculi, gastrointestinal upset, ulcers, and leukorrhea.

Investigational Uses

Initial research is available that focuses on the use of Oregon grape as an antioxidant and as a treatment for some skin disorders.

Actions

The possible actions of Oregon grape include antioxidant, antiproliferative, and cardiac relaxant.

Antioxidant Action

Most research studies have focused on the alkaloid components of Oregon grape and their antioxidant actions. Those with the most potent antioxidant actions are isothebaine and isocorydine (Sotnikova et al, 1997); berbamine and oxyacanthine (Bezakova et al, 1996); oxyberberine, corytuberine, and columbamine (Misik et al, 1995); and protoberberine (Rackova et al, 2007). Other alkaloids have been found to possess only weak antioxidant effects.

Antiproliferative Action

Several studies have demonstrated the antiproliferative action of Oregon grape (Augustin et al, 1999; Muller et al, 1994, 1995; Gulliver et al, 2005). All studies have confirmed that Oregon grape decreases the proliferation of psoriasis. Topical application was used to treat psoriasis in a double-blind placebo-controlled study with 82 individuals. Participants rated the effectiveness of Oregon grape as being more effective (Weisenauer et al, 1996). Another study (Augustin et al, 1999) compared treatments that differed on each side of participants' body. Skin biopsies were used to compare each sample. There was significant improvement in the Oregon grape group.

Cardiac Relaxant Action

The cardiac relaxant ability of Oregon grape was demonstrated by the use of the alkaloids isothebaine and isocorydine in rats. Both alkaloids showed relaxant effects in the aorta (Sotnikova et al, 1997).

Product Availability

Capsules, fluid extract, powder, tincture, topical ointment, topical cream

Plant Parts Used: Bark, roots, stems

Dosages

- Adult PO powder: ½-1 g tid
- Adult PO tincture: 2-4 ml tid
- Adult topical: apply tid to affected areas

Contraindications

Class 2b herb (root).

Pregnancy category is 5; breastfeeding category is 4A.

Oregon grape should not be given to children. It should not be used by persons with hypersensitivity to this herb or related herbs.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia

INTEG: Hypersensitivity reactions, burning

SYST: *Poisoning, death (high doses)*

Interactions

Herb

Berberine herbs: Oregon grape with other berberine herbs may increase risk for berberine toxicity (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid	Berberine; Magnoflorine	Weak antioxidant
	Oxyacanthine; Berbamine; Bisbenzy lisoquinoline alkaloid complex (BBI); Oxyberberine; Corytuberine; Columbamine; Armoline; Baluchistine; Obamegine; Aquifoline; Jatorrhizine; Protoberberine	Antioxidant
	Isocorydine; Isothebaine	Cardiac relaxant
	Hydrastine; Canadine; Corypalmine; Mahonine; Isoquinolone	
Tannin		

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of Oregon grape and administer an antihistamine or other appropriate therapy.
- Assess for use of excessive doses. Poisoning and death can result.

Administer

- Instruct the client to store Oregon grape products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 5 and breastfeeding category is 4A.
- Caution the client not to give Oregon grape to children.
- Advise the client that Oregon grape is not the same as barberry *(Berberis vulgaris)*.
- Inform the client that research is minimal for any uses and actions of Oregon grape.
- Caution the client that poisoning and death may result from high doses.

Pansy

(pan′zee)

Scientific name: *Viola tricolor*

Other common names: Field pansy, heart's ease, Johnny-jump-up, jupiter flower, ladies' delight, wild pansy

Origin: Pansy is found throughout the world.

Uses

Pansy traditionally has been used to treat whooping cough, upper respiratory tract conditions such as bronchitis, skin cancer, joint pain, and inflammation. Internally it is used as a laxative and to promote metabolism. Externally it is used to treat seborrheic skin diseases, acne, impetigo, pruritus vulvae, and cradle cap in children.

Investigational Uses

Initial research is available documenting the use of pansy in the treatment of heart and inflammatory conditions.

Actions

Little research has been done on pansy. One study showed a reduction in glucose transport in the rat small intestine (Gurman et al, 1992). Another demonstrated that one of the chemical components, kalata-peptide B_1, exerts antimicrobial activity (Gran et al, 2000). Another study (Toiu, et al, 2007) identified the antiinflammatory effects on bone marrow acute phase response. Total leukocyte and differential leukocyte counts were used as the measure mark.

Product Availability

Extract, tea, tincture

Plant Part Used: Flowers

Dosages

- Adult PO tea: 2-4 ml tid
- Adult PO tincture: 2-4 ml tid

Contraindications

Until more research is available, pansy should not be used during pregnancy and breastfeeding. It should not be given to children. Pansy should not be used by persons with hypersensitivity to this herb or salicylates.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, diarrhea (seeds)
INTEG: Hypersensitivity reactions

Interactions

Drug

Salicylates (aspirin): The actions of salicylates may be increased when used with pansy.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Flavonoid	Rutin; Luteolin; Scoparin; Saponarine; Violanthin	
Salicylate		Antiinflammatory; antipyretic
Terpene		
Carbohydrate		
Sterine		
Cyclic peptide	Kalata-peptide B1	Antimicrobial
Tannin		
Hydroxycoumarin	Umbelliferone	Anticoagulant

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of pansy and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store pansy products away from heat, light, and moisture.

Teach Client/Family

- Caution the client not to use pansy in children or those who are pregnant or breastfeeding until more research is available.

P

Papaya

(puh-pai'uh)

Scientific name: *Carica papaya*

Other common names: Melon tree, papain, pawpaw

Origin: Papaya is a tree grown in Mexico, Central America, and many tropical regions.

Uses

Papaya is used orally for intestinal worms and gastrointestinal disorders and topically for debridement of wounds such as decubiti and other necrotic ulcers. It is used by intradisk injection in a herniated lumbar intervertebral disk.

Actions

The primary action of papaya is its use as a debridement enzyme. The proteolytic enzymes papain and chymopapain have been used for centuries as a debridement vehicle for necrotic skin, primarily in decubitus ulcers. One research study (Rajkapoor et al, 2002) has shown dried papaya fruits to be hepatoprotective. Another study (Mehdipour et al, 2006) identified the antioxidant potential of papaya juice in the laboratory.

Product Availability

Tablets

Plant Parts Used: Seeds, pulp, leaves, latex

Dosage

- Adult PO: 10 mg qid for 7 days
- Adult topical: apply to affected area as needed for debridement
- Adult intradisk injection

Contraindications

Papaya should not be given to children or those who are pregnant, breastfeeding, or hypersensitive to this product. It should not be used in contact dermatitis or in bleeding disorders.

Side Effects/Adverse Reactions

CNS: Paralysis
CV: Hypotension, bradycardia
GI: Severe gastritis, *esophageal perforation*
INTEG: Dermatitis, caroteinemia
SYST: *Anaphylaxis*, allergic reactions

Interactions

Drug

Anticoagulants *(anisindione, dicumarol, heparin, warfarin):* When papaya is given with anticoagulants, there is a greater risk of bleeding and an increase in international normalized ratio (INR) and prothrombin time.

Herb

Papain: Papaya used with papain can increase adverse reactions (Jellin et al, 2008).

Lab Test

INR: Papaya can increase INR in those using warfarin (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Proteolytic enzymes	Papain	Debridement enzyme
	Chymopapain	
Alkaloids	Carpaine	
Glycosides	Myrosin; Caricin	

Client Considerations

Assess

- Assess the reason the client is using papaya.
- Identify if the client is using anticoagulants. There is an increased risk of bleeding when papaya is used with anticoagulants.

Administer

- Keep papaya in a closed container away from excessive heat, light, and moisture.

Teach Client/Family

- Teach the patient that papaya should not be used medicinally in children or those who are pregnant or breastfeeding until more research is available.

Parsley

(pahr'slee)

Scientific name: *Petroselinum crispum*

Other common names: Common parsley, garden parsley, rock parsley

Origin: Parsley is found throughout the world.

Uses

Traditionally, parsley has been used to treat cough, menstrual irregularities, gastrointestinal upset, dysuria, flatulence, and joint pain and inflammation. It is also used as a diuretic, antiinfective, and antispasmodic. In the fourteenth century, parsley was used to treat gastrointestinal conditions, asthma, urinary and hepatic disease, and the plague.

Investigational Uses

Initial research indicates that parsley may be useful for the treatment of hypertension, urinary tract dysfunction including urinary tract infection and kidney stones, menopause as an antioxidant, and symptoms in women.

Actions

Researchers have identified that parsley contains phytoestrogens and that it possesses urinary antioxidant, antidiabetic agents, and antihypertensive properties. However, little research has been done on any of its proposed actions.

Estrogenic Action

The phytoestrogens in parsley were identified when researchers were screening for an estrogen-sensitive breast cancer cell line. Parsley was shown to exert potent estrogenic activity, equal to that of soybeans (Yoshikawa et al, 2000).

Antioxidant Action

Parsley's urinary antioxidant action was demonstrated in a study involving seven men and seven women (Nielsen et al, 1999). Participants began intake of parsley to identify the excretion of flavones and on biomarkers for oxidative stress. Researchers observed an increase in the antioxidant effect. Another earlier study (Fejes et al, 1998, 2000) produced similar results. The flavonoids present in parsley were shown to exert the strongest antioxidant effect.

Product Availability

Capsules, essential oil, fluid extract, tea

Plant Parts Used: Leaves, oil, roots, seeds

Dosages

- Adult PO crushed herb and root: 6 g/day
- Adult PO fluid extract: 2-4 ml (1:1 dilution in 25% alcohol) tid
- Adult PO tea: use 2-6 g leaves or roots

Contraindications

Class 2b, 2d herb (leaf, root).

Until more research is available, parsley should not be used therapeutically during pregnancy and breastfeeding. It should not be given therapeutically to children. The essential oil should not be used by persons with renal inflammation. Those with cardiac/renal/hepatic conditions should avoid the therapeutic use of this herb.

Side Effects/Adverse Reactions

CNS: Hallucinations, giddiness, paralysis
CV: Hypotension, *arrhythmias*
GI: Nausea, vomiting, anorexia, *gastrointestinal bleeding, hepatotoxicity, fatty liver*
GU: *Renal damage*
INTEG: Hypersensitivity reactions, contact dermatitis, phototoxicity
RESP: Pulmonary vascular congestion

Interactions

Drug

Anticoagulants *(heparin, warfarin):* Large amounts of parsley may interfere with anticoagulation therapy (theoretical).
Antihypertensives: Parsley may cause increased hypotension when used with antihypertensives; do not use concurrently.
Aspirin: Use of aspirin may precipitate parsley allergy.
Diuretics: Parsley leaf/root may interfere with diuretics' action (theoretical).
Lithium: Parsley combined with lithium may lead to dehydration, lithium toxicity.
MAOIs: MAOIs used with tricyclics or selective serotonin reuptake inhibitors (SSRIs) may lead to serotonin syndrome when used with parsley; do not use concurrently.
Opioids: Opioids may cause serotonin syndrome when used with parsley; do not use concurrently.

Lab Test

INR: Parsley may decrease INR, due to vitamin K content (theoretical).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Mineral	Calcium; Iron	
Vitamin	A; B; C	
Glycoside	Acetylapiin Apigenin; Luteolin	Estrogenic
Glucoside	Petroside	Estrogenic
Protein		
Carbohydrate		
Furanocoumarin	Bergapten Psoralen; Methoxypsoralen; Oxypeucedanin	Phototoxicity
Volatile oil	Myristicin; Apiole; Beta-phellandrene	
Flavonoid	Apiin; Luteolin	

= Pregnancy = Pediatric = Alert = Popular Herb

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of parsley and administer an antihistamine or other appropriate therapy.
- Assess for cardiac, hepatic, or renal disease. Clients with these conditions should avoid using parsley therapeutically.
- Assess for medications used (see Interactions).

Administer

- Instruct the client to store parsley products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use parsley therapeutically in children or those who are pregnant or breastfeeding until more research is available.
- Inform the client that research is lacking for any uses or actions of parsley.
- Advise the client to use sunscreen and wear protective clothing to prevent phototoxic reactions.

Parsley Piert

(pahr′slee)

Scientific name: *Aphanes arvensis*

Other common names: Field lady's mantle, parsley breakstone, parsley piercestone

Origin: Parsley piert is an annual found in North America, Europe, and parts of Africa.

Uses

Parsley piert is used to treat urinary tract disorders such as infections and renal stones. It is also used as a diuretic and to reduce fever.

Actions

No research studies have been done for parsley piert, although its use continues. This herb is known to contain tannins, which are well known for their wound-healing and astringent properties. These chemicals are thought to act on the genitourinary system to soothe irritation.

Product Availability

Dried herb, fluid extract, tincture

Plant Parts Used: Aerial parts

Dosages

- Adult PO fluid extract: 2-4 ml tid
- Adult PO tincture: 2-4 ml tid
- Adult PO tea: ½ cup herb in 1 pt boiling water; may be taken tid-qid
- Adult PO dried herb: 2-4 g tid
- Adult PO infusion: 2-4 g tid

Contraindications

Until more research is available, parsley piert should not be used during pregnancy and breastfeeding. It should not be given to children. This herb should not be used by persons with hypersensitivity to it.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Tannin		Wound healing; astringent

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of parsley piert and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store parsley piert in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use parsley piert in children or those who are pregnant or breastfeeding until more research is available.
- Advise the client that research is lacking for any uses or actions of this herb.

Passionflower

(pa'shuhn flou'uhr)

Scientific name: *Passiflora incarnata*

Other common names: Apricot vine, granadilla, Jamaican honeysuckle, maypop, maypot, passion fruit, passion vine, purple passion flower, water lemon

Origin: Passionflower is a perennial found in the tropics of the Americas.

Uses

Passionflower is used as a sedative and to treat anxiety, sleep disorders, attention deficit–hyperactivity disorder, seizures, neuralgia, nervous tachycardia, restlessness, and opiate withdrawal. Topically passionflower is used for hemorrhoids, burns, and inflammation.

Investigational Uses

Initial research is underway to identify the use of passionflower in the treatment of the symptoms of Parkinson's disease and as an antitussive.

Actions

Anxiolytic Action

Research on passionflower is lacking. Initial evidence indicates a possible anxiolytic action. One study using laboratory mice evaluated several herbs for their central nervous system effects: *Crataegus oxyacantha, Valeriana officinalis, Hyoscyamus niger, Matricaria chamomilla, Piscidia erythrina, Atropa belladonna,* and *Passiflora incarnata. Passiflora incarnata* showed anxiolytic action, whereas *Crataegus oxyacantha* and *Valeriana officinalis* showed sedative effects. The other herbs showed either no action or only limited central nervous system activity (Della Loggia et al, 1981). Other studies (Movafegh et al, 2008; Soulimani et al, 1997) showed similar results when the chemical components harman, harmine, harmaline, harmol, harmalol, orientin, isoorientin, vitexin, and isovitexin were tested in mice. Sedative effects were confirmed after laboratory testing.

Opiate Withdrawal

One study is available that confirmed the decrease in opiate cravings, restlessness, anxiety, and irritability (Akhondzadeh, 2001).

Antitussive Action

The significant antitussive activity of *Passiflora incarnata* was identified when administered to sulfur-dioxide–induced cough in mice (Dhawan et al, 2002).

Product Availability

Crude extract, dried herb, fluid extract, homeopathic products, tincture

Plant Parts Used: Flowers, fruit

Dosages

General Dosages

- Adult PO: 10-30 drops tid (0.7% flavonoids)
- Adult PO dried herb: 0.25-1 g tid
- Adult PO fluid extract: 0.5-1 ml tid
- Adult PO tea: 4-6 tsp of herb in three divided doses
- Adult PO tincture: 0.5-2 ml tid

Insomnia

- Adult PO dried herb/tea: 4-8 g at bedtime (Murray, Pizzorno, 1998)
- Adult PO dry powdered extract: 300-450 mg at bedtime (2.6% flavonoids) (Murray, Pizzorno, 1998)
- Adult PO fluid extract: 2-4 ml (½-1 tsp) at bedtime (1:1 dilution) (Murray, Pizzorno, 1998)
- Adult PO tincture: 6-8 ml (1½-2 tsp) at bedtime (1:5 dilution) (Murray, Pizzorno, 1998)

Contraindications

Pregnancy category is 2; breastfeeding category is 2A.

Passionflower should not be given to children. It should not be used by persons with hypersensitivity to this herb.

Side Effects/Adverse Reactions

CNS: *CNS depression (high doses)*

GI: Nausea, vomiting, anorexia, *hepatic toxicity*

Continued

Side Effects/Adverse Reactions—cont'd

INTEG: Hypersensitivity reactions

Toxicity: *Severe nausea, vomiting, drowsiness, prolonged QTc, nonsustained ventricular tachycardia* (Fisher et al, 2000)

Interactions

Drug

CNS depressants *(alcohol, antianxiety agents, antipsychotics, barbiturates, opiates, benzodiazepines, sedative/hypnotics):* Use of passionflower with central nervous system depressants may cause increased sedation; avoid concurrent use (theoretical).

MAOIs: Use of passionflower with MAOIs may cause increased MAOI activity; avoid concurrent use (theoretical).

Herb

Anticoagulant/antiplatelet herbs, sedative herbs: Passionflower may increase the action of anticoagulant/antiplatelet herbs, sedative herbs (theoretical).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Flavonoid	Vitexin; Isoorientin; Isovitexin	Anxiolytic
	Umbelliferone; Coumarin; Schaftoside; Isoschaftoside	
Alkaloid	Harman; Harmaline	Uterine stimulant; MAOI action
	Harmine; Harmalol; Harmol	
Pyrone	Maltol	Sedative
Glycoside	Gynocardin	Cyanogenic
Carbohydrate	Sucrose	

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of passionflower and administer an antihistamine or other appropriate therapy.
- Assess for toxicity (see Side Effects) if the client is using high doses of this herb or is taking it for a prolonged period.

Administer

- Instruct the client to store passionflower products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 2 and breastfeeding category is 2A.
- Caution the client not to give passionflower to children.

= Pregnancy = Pediatric = Alert = Popular Herb

Pau D'arco

(pah'ew dahr'koe)

Scientific name: *Tabebuia impetiginosa*

Other common names: Ipe, ipe roxo, ipes, la pacho, lapacho, lapacho colorado, lapacho morado, lapachol, purple lapacho, red lapacho, roxo, taheebo, tajibo, trumpet bush, trumpet tree

Origin: Pau d'arco is a tree found in South America, Central America, Mexico, and Florida.

Uses

Pau d'arco is used in South America and the Caribbean to treat various conditions such as cold and flu, diarrhea, fever, parasitic infections, sexually transmitted diseases, candida infection (orally, topically), snakebite, wounds, joint pain, urinary incontinence, psoriasis, and infections. It is also used for ulcers, gastritis, liver ailments, asthma, bronchitis, cystitis, and boils and as a tonic, blood builder, and aphrodisiac.

Investigational Uses

Other possible uses for pau d'arco include the treatment of cancer, HIV/AIDS, hepatic disorders, diabetes mellitus, and lupus (systemic lupus erythematosus). It may also show efficacy as an antimicrobial.

Actions

Antimicrobial Action

The major focus of research for pau d'arco is its antimicrobial effects. One study demonstrated its activity against *Staphylococcus aureus, Escherichia coli,* and *Aspergillus niger.* Of the extracts tested, pau d'arco was one of the most active (Anesini et al, 1993). Another study demonstrated the remarkable broad-spectrum antimicrobial activity of this herb against many gram-positive and gram-negative bacteria and fungi (Binutu et al, 1994). The stem bark was shown to be the most active; extracts of leaves were active only against *Candida albicans.* Park et al (2006) identified the action of pau d'arco against *Helicobacter pylori.*

Antipsoriatic Action

The antipsoriatic activity of pau d'arco was confirmed using compounds available in passionflower (Muller et al, 1999).

Other Actions

Lapachol, a chemical constituent, demonstrated antiulcerogenic effects in animal models. Protection was significant with 5 mg/kg.

Product Availability

Capsules, extract, salve, tablets, tea, tincture, liquid

Plant Part Used: Bark

Dosages

- Adult PO capsules/tablets: 2 caps/tabs bid with water at meals; may be used as a tea
- Adult PO lapachol: 1 g daily; max 1.5 g daily
- Adult PO tea: place 15 g bark in 2 cups water, boil 10 min, strain, or use the contents of the capsules
- Adult PO tincture: 0.5-1 ml tid
- Adult PO glycerin-based liquid: 1-3 ml tid

Contraindications

Pregnancy category is 6; breastfeeding category is 3A.
Pau d'arco should not be given to children. It should not be used by persons with hypersensitivity to this herb or those with hemophilia, von Willebrand's disease, thrombocytopenia, or other coagulative disorders.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions
SYST: *Bleeding; toxic reactions (theoretical)*

Interactions

Drug

Anticoagulants *(heparin, salicylates, warfarin):* Use of pau d'arco with anticoagulants may result in an increased risk of bleeding; avoid concurrent use (theoretical).
Phytonadione *(vitamin K):* Use of pau d'arco with phytonadione may cause prolongation of protime.

Herb

Anticoagulant/antiplatelet herbs: Pau d'arco with anticoagulant/antiplatelet herbs may increase risk of bleeding (theoretical).

Lab Test

Prothrombin time (PT)/international normalized ratio (INR): Pau d'arco may increase PT/INR.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Quinone	Lapachone; Lapachol Tabebuin	Antimicrobial
Dialdehyde	Methoxybenzoyloxy; Dimethoxybenzoyloxy	

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of pau d'arco and administer an antihistamine or other appropriate therapy.
- Determine whether the client is using other anticoagulants (e.g., warfarin, heparin, salicylates) or has a coagulation deficiency. These clients should avoid using this herb (see Interactions).

Administer

- Instruct the client to store pau d'arco in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 6 and breastfeeding category is 3A.
- Caution the client not to give pau d'arco to children.

Peach ❗

(peech)

Scientific name: *Prunus persica*

Other common names: Amygdalin, laetrile, vitamin B_{17}

Origin: Peach is a tree found throughout the world.

Uses

Traditionally, the bark and leaves of the peach tree have been used as an anthelmintic, an expectorant, an astringent, and a diuretic, as well as to treat insomnia, cough, and constipation. In the 1970s, peach pits (Laetrile) were a popular but unproved treatment for cancer in other countries. Topically, peach is used to treat minor skin disorders such as burns, abrasions, blisters, scratches, eczema, psoriasis, and warts.

Actions

Initial research is available on the use of *Prunus persica* as an antifungal, as an agent to decrease melanin biosynthesis, and in combination to treat platelet aggregation defect and uterine myomas.

Antifungal Action

Peach has been shown to possess antifungal properties. When researchers screened 15 species of leaves for fungitoxic activity, the leaves of *Prunus persica* completely inhibited mycelial growth of *Aspergillus flavus* (Mishra et al, 1990).

Melanin Biosynthesis Inhibitor

Another study identified the inhibitory properties of peach on melanin biosynthesis (Matsuda et al, 1994). Investigators collected 38 different herbs and used the dried leaves. Results suggest that dried peach leaves may be used as a whitening agent for the skin.

Platelet Aggregate Action

In a study testing the platelet aggregate properties of *Prunus persica, Carthamus tinctorium,* and *Glycyrrhiza uralensis,* the experimental group experience a significant change in platelet aggregation (Shen et al, 1994).

Uterine Myoma Inhibitor

In a study testing the effects of peach on uterine myomas, the myomas shrank in 60% of the cases (Sakamoto et al, 1992).

Anticancer Action

Peach pits (under the product name Laetrile) were used extensively as a cancer treatment in the 1970s, primarily in Mexico. However, Laetrile is not currently used because of the potential for cyanide poisoning.

Other Actions

One study (Suh et al, 2006) identified the cholinesterase inhibitory action of peach in rats. Peach penetrates into the brain and inhibits cholinesterase. Peach may be useful in Alzheimer's disease.

Product Availability

Bark, kernel oil, leaves, persic oil, seeds

Plant Parts Used: Bark, kernels, leaves, seeds

Dosages

- Adult PO tea (bark): boil ½ oz bark in 1 pt water, let stand 15 min, strain; may be taken tid
- Adult PO tea (leaves): boil 1 oz leaves in 1 pt water, let stand 15 min, strain; may be taken tid

Contraindications

Class 2d herb (seed).

Until more research is available, peach should not be used therapeutically during pregnancy and breastfeeding. It should not be given therapeutically to children. Peach should not be used by persons with hypersensitivity to it.

Side Effects/Adverse Reactions

Cyanide poisoning (peach pits): *Severe vomiting, abdominal or epigastric pain, dizziness, coma, seizures, death*

EENT: Optic atrophy, tinnitus

GI: Nausea, vomiting, anorexia

INTEG: Hypersensitivity reactions

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Bark, leaves, and seeds contain **Amygdalin** ***Bark and leaves also contain*** **Phloretin**		Cyanide poisoning

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of peach and administer an antihistamine or other appropriate therapy. Advise clients who are hypersensitive to peach skin to wear gloves when handling.
- Assess for chronic cyanide poisoning: vision changes with optic atrophy, dizziness, nerve pain, and nerve deafness. If these are present, discontinue the use of peach immediately.

Administer

- Instruct the client to store peach in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use peach therapeutically in children or those who are pregnant or breastfeeding until more research is available.
- Advise the client to use only the bark, leaves, or seeds—never peach pits—because of the potential for cyanide poisoning.

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Pectin

(pehk'tuhn)

Origin: Pectin is found in the cell walls of all plants.

Uses

Traditionally, pectin has been used to treat diarrhea and to reduce blood glucose and high cholesterol levels. Topically, pectin can protect mouth ulcers.

Investigational Uses

Investigators are working to determine whether pectin can help prevent or reduce radiation sickness.

Actions

Most of the available research focuses on the use of pectin to lower blood glucose levels and cholesterol.

Anticholesterol Action

The addition of pectin and guar to the diet has been shown to reduce total cholesterol and triglycerides (Biesenbach et al, 1993). Another study showed that pectin decreases the transit time of feces in the colon, possibly reducing the risk of colon cancer (Harris et al, 1993).

Other Actions

One study (Rabbani et al, 2001) identified the use of pectin in controlling persistent diarrhea in Bangladeshi children. The diarrhea was significantly decreased by day 4 after green banana or pectin was introduced.

Product Availability

Pectin is not commercially available.

Plant Parts Used: Cell walls of all plants, usually obtained from the rind of citrus fruits and apple.

Dosages

No dosage consensus is available.

Contraindications

No absolute contraindications are known.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions
RESP: Asthma (inhalation of pectin dust)

Interactions

Drug

Digoxin, lovastatin, tetracyclines: Pectin can interfere with the absorption of these agents.
Oral medications: Pectin reduces the absorption of all drugs, vitamins, and minerals if taken concurrently. Separate doses by 3 hours to ensure adequate absorption.

Continued

Interactions—cont'd

Herb

Beta-carotene: Pectin reduces beta-carotene absorption.

Food

Nutrients: Pectin can interfere with the absorption of all nutrients.

Lab Test

Cholesterol: Pectin can reduce cholesterol test results.

Pharmacology

Pharmacokinetics

Pectin is an adsorbent, a soluble fiber; binds cholesterol and is not metabolized.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Polysaccharide Protopectin		Insoluble compound

Client Considerations

Assess

- Assess for hypersensitivity reactions, such as asthma from the inhalation of pectin dust. If present, discontinue the use of pectin and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store pectin in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Advise the client not to inhale pectin dust.
- Inform the client that it is necessary to separate doses of drugs, vitamins, and minerals from doses of pectin to ensure adequate absorption (see Interactions).

Pennyroyal

(pehn-ee-rawee'uhl)

Scientific names: *Hedeoma pulegioides* (American pennyroyal), *Mentha pulegium* (European pennyroyal)

Other common names: American pennyroyal, European pennyroyal, mock pennyroyal, mosquito plant, pudding grass, squawbalm, squawmint, tickweed

Origin: American pennyroyal is found throughout North America in wooded regions.

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Uses

Traditionally, pennyroyal has been used as an abortifacient and to treat gout, menstrual ailments, uterine fibroids, colds, fevers, flu, chest congestion, and colic, and digestive, hepatic, and gallbladder diseases. Externally, it is used to treat skin diseases. Some herbalists recommend the use of pennyroyal for treating tumors. It may also be used as an insect repellant.

Actions

Little scientific research has been done on any uses or actions of pennyroyal. This herb is used as an insect repellent and has been used in the food and cosmetic industry for years. Most of the available information comes from anecdotal reports. Pennyroyal oil is extremely toxic and should not be ingested for any use.

Product Availability

Dried herb, dried leaves, flowers, oil

Plant Parts Used: Flowering tops, leaves

Dosages

NOTE: Pennyroyal is extremely toxic.

- Adult PO tea (dried herb): place 1 tbsp dried herb in 8 oz warm water; may be taken bid
- Adutl PO tea (dried leaves): place 2 tsp dried leaves in 8 oz boiling water, let stand 15 min, strain; may be taken bid

Contraindications

Pregnancy category is 7; breastfeeding category is 5A.

Pennyroyal should not be given to children. Persons with seizure disorders, renal/hepatic disease, or those with hypersensitivity to this herb, should not use it. Pennyroyal oil is extremely toxic and should not be ingested. Dried leaf tea is safe to drink.

Side Effects/Adverse Reactions

CNS: Fatigue, confusion, dizziness, hallucinations, malaise, *seizures, rigors, coma, death*
CV: Hypertension
GI: Nausea, vomiting, anorexia, abdominal pain and cramping, *hepatotoxicity*
GU: *Nephrotoxicity*
INTEG: Hypersensitivity reactions
Reproductive: *Abortion*
RESP: *Respiratory depression*

Interactions

Drug

Cytochrome P450: Concurrent use of pennyroyal with drugs metabolized by cytochrome P450 should be avoided.

Lab Test

ALT, AST, total bilirubin, urine bilirubin: Pennyroyal may cause increased ALT, AST, total bilirubin, and urine bilirubin.
Red blood cells: Pennyroyal may cause decreased red blood cells.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Monoterpene	Pulegone	Abortifacient
Hedeomal		
Tannin	Rosmarinic acid	
Alpha-pinene		
Beta-pinene		
Octanone		
Limonene		
Cymene		
Octanol		
Octylacetate		
Methylcyclohexanone		
Methone		
Piperitenone		
Paraffin		
Volatile oil	Isomenthone; D-pulegone; Menthone	
Flavonoid	Diosmin; Hesperidin	

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of pennyroyal and administer an antihistamine or other appropriate therapy.
- Assess for symptoms of toxicity: lethargy, malaise, fatigue, oliguria, jaundice, seizures. If these are present, discontinue the use of pennyroyal immediately and administer supportive measures.

Administer

- Instruct the client to use pennyroyal only under the supervision of a qualified herbalist. This herb can be toxic.
- Instruct the client to store pennyroyal products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use pennyroyal in children or those who are pregnant or breastfeeding.
- Caution the client to avoid self-administration of this herb because of its toxicity.

Peppermint

(pep′er-mint)

Scientific name: *Mentha piperita*

Other common names: Brandy mint, lamb mint

Origin: Peppermint is found in Europe, the United States, and Canada.

= Pregnancy = Pediatric = Alert = Popular Herb

Uses

Peppermint has been used internally as an antiseptic and to treat flatulence, vomiting, diarrhea, abdominal pain, indigestion, irritable bowel syndrome, colic, and gallbladder disorders. It has also been used internally to decrease colonic spasms during endoscopy. Topically, peppermint has been used to relieve sunburn, arthritis pain, and neuralgia. It is also used in aromatherapy and as a flavoring in liquor, foods, mouthwash, and gum.

Investigational Uses

Peppermint is being studied for its anti–HIV-1, antiviral, and antibacterial actions.

Actions

Actions for mint are categorized by species (i.e., spearmint, peppermint). Spearmint and peppermint have similar actions, but research studies tend to focus on one species or the other.

Anti–HIV-1 and Antiviral Actions

One study evaluated the anti–HIV-1 activity of peppermint using various herbs of the Labiatae family (Yamasaki et al, 1998). Most of the plants tested showed significant anti–HIV-1 activity, including *Mentha x piperita.* The essential oils are believed to be responsible for this action. Peppermint has been shown to also possess antiviral activity against herpes simplex, Newcastle disease, and vaccinia (Leung, 1980).

Antibacterial Action

Other studies have reported on the antibacterial properties of peppermint. It has been shown to decrease *Candida* spp.

Irritable Bowel Syndrome

Persons with irritable bowel syndrome may find that peppermint oil relieves symptoms. In a placebo-controlled, double-blind study, *Piper x piperita* extract was evaluated for this purpose. Researchers found that peppermint oil decreased irritable bowel syndrome symptoms by inhibiting gastrointestinal smooth-muscle action (Pittler et al, 1998).

Product Availability

Enteric-coated capsules (peppermint), fluid extract, gum, liniment, lozenges, mouthwash, oil, ointment, tea, toothpaste

Plant Parts Used: Leaves, oil extracted flowers

Dosages

Aromatherapy and Congestion Relief

- Adult inhalant oil: use prn

Irritable Bowel Syndrome

- Adult PO enteric-coated peppermint oil capsules: 2 ml bid between meals (Murray, Pizzorno, 1998)

Other

- Adult PO capsules: 2 caps tid
- Adult PO extract: 20 drops with 4 oz of water
- Adult PO oil: 20 drops with 4 oz of water
- Adult PO tea: place 1 tbsp leaves in 2 cups boiling water, steep 15 min; may be taken bid-tid
- Adult topical ointment: apply prn to affected area up to tid

Contraindications

Pregnancy category is 3; breastfeeding category is 3A.

Peppermint should not be given internally to children. It should not be used internally by persons with hypersensitivity to it or by those with gallbladder inflammation, severe hepatic disease, gastroesophageal reflux disease, or obstruction of bile ducts. Peppermint should not be used topically on the face, particularly near the nose, or on infants or small children.

Side Effects/Adverse Reactions

GI: Nausea, anorexia, increased indigestion with hiatal hernia, exacerbation of biliary colic

INTEG: Peppermint oil: hypersensitivity reactions (flushing, rash, headache, heartburn, mucous membrane irritation, urticaria, erythema); contact dermatitis (topical)

SYST: *Bronchospasm*

Interactions

Drug

Peppermint oil: antacids, H_2-blockers, proton pump inhibitors: These agents may cause premature dissolution of enteric-coated peppermint oil (Jellin et al, 2008).

Cytochrome P450 3A4 substrate: Peppermint oil may decrease drugs metabolized by cytochrome P450 3A4 substrates (Jellin et al, 2008).

Pharmacology

Pharmacokinetics

Carminative action results from esophageal sphincter tone reduction.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Peppermint contains		
Volatile oil	Menthol; Menthone	Counterirritant; spasmolytic; antimicrobial (Iscan et al, 2002)
Tannin		
Flavonoid		Choleretic
Tocopherol		
Spearmint contains		
Carvone		
Limonene		
Phellandrene		
Pinene		

Client Considerations

Assess

- Assess for hypersensitivity reactions (see Side Effects). If present, discontinue the use of peppermint and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store peppermint products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 3A.
- Caution the client not to give peppermint to children.
- Caution the client to keep peppermint oil products away from mucous membranes and abrasions.
- Caution clients with gastroesophageal reflux disease not to use peppermint. It may worsen the condition.
- Caution the client not to use peppermint oil with a heating pad or near an open flame.

Perilla

(puh-ri′luh)

Scientific name: *Perilla frutescens* L.

Other common names: Beefsteak plant, wild coleus

P

Origin: Perilla is found in the Orient.

Uses

Perilla is used to treat allergic reactions and asthma. It is also used as a flavoring. Traditionally, perilla has been used as an antispasmodic, as well as to treat nausea, vomiting, and upper respiratory tract conditions.

Investigational Uses

Initial research is available that documents the use of perilla as a hyperlipidemic antiasthma and a cancer protectant.

Actions

Most of the research on perilla has focused on its ability to inhibit allergic reactions. Initial research has also begun to determine its hyperlipidemic and cancer protectant actions.

Antiallergy Action

One study tested the ability of perilla to inhibit induced systemic allergic reactions. Perilla was found to inhibit mast cell-mediated immediate-type allergic reactions (Shin et al, 2000). Other studies have also confirmed the use of perilla for the inhibition of allergic reactions (Imaoka et al, 1993; Ishihara et al, 1999). Luteolin, one of perilla's chemical components, showed a potent inhibitor of tumor necrosis factor-alpha, inhibitor of oxazolone-induced allergic edema and an inhibitor of arachidonic acid (Ueda et al, 2002).

Other Actions

One study (Simoniene et al, 2005) identified the increase in phagocytosis activity in the laboratory. Another study (Korotkich et al, 2006) identified the inotropic and lusitropic effects of perilla on the rabbit myocardium.

Product Availability

Expressed oil of the seed, tea

Plant Parts Used: Dried leaves, seeds

Dosages

Asthma

- Adult PO seed oil: 10-20 g

No other published dosages are available.

Contraindications

Until more research is available, perilla should not be used during pregnancy and breastfeeding. It should not be given to children. Persons with hypersensitivity to perilla should not use it.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia

INTEG: Hypersensitivity reactions

Interactions

Drug

Corticosteroids *(betamethasone, dexamethasone, hydrocortisone, methylprednisolone, prednisolone, prednisone, triamcinolone):* Perilla may augment the effect of corticosteroids; avoid concurrent use.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Benzoxepin	Perilloxin; Dehydroperilloxin (Liu et al, 2000)	
Essential oil	Perillaldehyde; Perilla alcohol	Dermatitis
	Perilla ketone	Lung toxin
	Trans-caryophyllene; Hexadecanoic acid; Alpha-pinene; Citral; Limonene	
Flavone	Apigenin; Shishonin	
	Luteolin	Inhibitor of arachidonic-acid, tumor necrosis factor-alpha, oxazolone-induced allergic edema

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of perilla and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store perilla in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use perilla in children or those who are pregnant or breastfeeding until more research is available.

Peyote

(pay-oe'tay)

Scientific name: *Lophophora williamsii*

Other common names: Anhalonium, big chief, buttons, cactus, mesc, mescal, mescal buttons, mescaline, mexc, moon, pan peyote, peyote button

Controlled Substance: Schedule I

Origin: Peyote is found in Mexico and the southwestern region of the United States.

Uses

Traditionally, peyote has been used in Indian culture during religious activities. Other traditional uses include treatment for arthritis, rheumatism, snakebite, burns, cardiac ailments, addiction, and paralysis. Peyote is also used as a hallucinogenic, an antimicrobial, and a sedative. Topically, peyote is used for fractures and wounds. Its use is illegal in the United States and most European countries.

Actions

Hallucinogenic Action

Research studies to date have focused on the hallucinogenic effects of peyote. One study (Keller et al, 1980) identified the ability of this herb to promote catecholamine metabolism. This research compared normal brain catecholamine formation with catecholamine metabolism that causes mind-altering effects. Results of these studies may eventually be useful in identifying a use for peyote in the treatment of mental illness.

Other Actions

Peyote was studied in the laboratory for tumor cell toxicity. It was concluded that peyote extracts were toxic to tumor cells and decreased immunopotentiating properties (Franco-Molina et al, 2003).

Product Availability

Basic pan peyote, button, mescaline hydrochloride, mescaline sulfate, soluble peyote, tincture

Plant Parts Used: Dried tops, whole plant

Dosages

No published dosages are available.

Contraindications

Peyote should not be used during pregnancy and breastfeeding. It should not be given to children. Persons with hypersensitivity to this herb should not use it. Physical dependence and death can result from the use of peyote.

Side Effects/Adverse Reactions

CNS: Anxiety, paranoia, hallucinations, tremors, ataxia
CV: *Hypertension, tachycardia*
GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions
SYST: *Death*

Interactions

Drug

CNS stimulants: Peyote may increase central nervous system stimulation when taken with these agents.

Pharmacology

Pharmacokinetics

Peak 4-6 hours; duration 14 hours.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid	Mescaline Formylmescaline; Acetylmescaline; Methylmescaline; Demethylmescaline; Dimethoxyphenylethylamine; Tyramine; Hordenine; Candicine; Anhalamine; Anhaladine; Anhalanine; Formylanhalamine	Hallucinogenic

Client Considerations

Assess

- Assess the client's use of this drug or other hallucinogens (see Interactions).

Administer

- Peyote should not be administered for any reason. Use of this herb is illegal in the United States and most European countries. Physical dependence and death can occur from its use.

Teach Client/Family

- Caution the client not to use peyote in children or those who are pregnant or breastfeeding.
- Advise the client that peyote is illegal and is not considered useful for any condition.
- Inform the client that physical dependence and death can result from peyote use.

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Pill-Bearing Spurge

(pil beh'ring spuhrj)

Scientific names: Euphorbia pilulifera; also known as *Euphorbia hirta, Euphorbia capitata*

Other common names: Asthma weed, catshair, euphorbia, garden spurge, milkweed, queensland asthmaweed, snake weed

Origin: Pill-bearing spurge is an annual found in India, Australia, and the southwestern region of the United States.

Uses

Pill-bearing spurge is used to treat respiratory conditions such as asthma, bronchitis, and allergies. It is also used for expulsion of worms and to treat colds, diarrhea, amebiasis, sexually transmitted diseases, snake bite, and ophthalmic conditions.

Actions

Very little primary research has been done on pill-bearing spurge. Most research or literature identifies the toxicity of the plant. One study identifies the cancer risk for humans who consume products from livestock fed species of spurge (Zayed et al, 1998). Iranians who consumed milk from goats and sheep fed spurge showed a high local incidence of esophageal cancer. Another earlier study discusses the tumor-producing action of spurge (Hergenhahn et al, 1984).

One study identified the antidiarrheal action of spurge resulting from quercetin, one of its chemical components (Galvez et al, 1993). Another study has shown the sedative actions of this herb, with lower doses producing an anxiolytic action (Lanhers et al, 1991).

Product Availability

Capsules, fluid extract, powder, tablets, tincture

Plant Part Used: Dried whole plant

P

Dosages

- Adult PO fluid extract: 0.2-0.3 ml tid (1:1 dilution in 45% alcohol)
- Adult PO infusion: 120-300 mg tid
- Adult PO powder: 120-300 mg tid
- Adult PO tincture: 0.5-2 ml tid (1:5 dilution in 60% alcohol)

Contraindications

Until more research is available, pill-bearing spurge should not be used during pregnancy and breastfeeding. It should not be given to children. Persons with hemophilia, von Willebrand's disease, or other bleeding disorders should not use this herb. Persons with hypersensitivity to pill-bearing spurge should not use it.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, gastric symptoms
INTEG: Hypersensitivity reactions, contact dermatitis

Interactions

Drug

ACE inhibitors: ACE inhibitors may increase hypotension when used with pill-bearing spurge; avoid concurrent use (theoretical).

Continued

Interactions—cont'd

Anticholinergics *(atropine, belladonna, scopolamine):* Pill-bearing spurge may decrease the effects of anticholinergics; avoid concurrent use (theoretical).

Anticoagulants *(heparin, salicylates, warfarin),* ***barbiturates*** *(phenobarbital),* ***cholinesterase inhibitors*** *(edrophonium, donepezil, physostigmine):* Pill-bearing spurge may increase the effects of anticoagulants, barbiturates, cholinesterase inhibitors; avoid concurrent use (theoretical).

Disulfiram: Reaction may occur when disulfiram is used with pill-bearing spurge; do not use concurrently (theoretical).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Choline		Antispasmodic
Shikimic acid		Antispasmodic
Flavonoid	Quercitrin; Quercetin; Leuocyanidin	
Triterpene	Taraxerone; Taraxerol; Alpha-amyrin; Beta-amyrin	
Sterol	Campesterol; Sitosterol	
Alkane	Hentriacontane	
Phenol	Sinapylglutathione	
Resin		
Tannin		

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of pill-bearing spurge and administer an antihistamine or other appropriate therapy.
- Assess all medications used by the client. Several theoretical drug interactions may occur (see Interactions).

Administer

- Instruct the client to store pill-bearing spurge in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use pill-bearing spurge in children or those who are pregnant or breastfeeding until more research is available.
- Give the client a written list of medications that should not be taken with this herb.
- Advise the hypersensitive client to avoid even touching this herb.

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Pineapple

(pine′a-puhl)

Scientific name: *Ananas comosus*

Other common names: Ananas, golden rocket, smooth cayenne

Origin: Pineapple is found in South America, Thailand, and Hawaii.

Uses

Pineapple is used therapeutically to treat obesity and constipation. Topically, pineapple may be used to treat wounds and inflammation.

Actions

Antifungal Action

One study found that the chemical components of pineapple stems possess antifungal effects against *Pythium* sp. (Tawata et al, 1996).

Other Actions

Bromelain, a chemical component of pineapple, has shown promise as a platelet aggregation inhibitor. Bromelain also possesses fibrinolytic, antiinflammatory, antitumor, and skin debridement actions (Taussig et al, 1988). Another study (Rowan et al, 1990) showed rapid debridement of wounds using enzyme fractions from the pineapple stem. Debridement occurred within 4 hours. Xie et al (2005) identified antidiabetic and antidyslipidemic action of pineapple. One study (Báez et al, 2007) focused on the antitumoral activity of pineapple.

Product Availability

Candy, extract, flavorings, juice, syrups, whole fruit

Plant Part Used: Fruit

Dosages

No published dosages are available.

Contraindications

Until more research is available, pineapple should not be used therapeutically during pregnancy and breastfeeding. It should not be given therapeutically to children. Pineapple should not be used therapeutically by persons with coagulation disorders. Persons with hypersensitivity to pineapple should not use it.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, diarrhea, stomatitis
GU: Uterine contractions
INTEG: Hypersensitivity reactions, rash

Interactions

Drug

ACE inhibitors: Pineapple may antagonize the action of ACE inhibitors; avoid concurrent use.
Anticoagulants *(heparin, salicylates, warfarin):* Pineapple may increase bleeding time when used with anticoagulants; avoid concurrent use.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Proteolytic enzyme	Bromelain	Wound healing; antiinflammatory; antitumor
Acid	Malic acid; Citric acid	
Vitamin	A; C	

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of pineapple and administer an antihistamine or other appropriate therapy.
- Assess for the use of ACE inhibitors and anticoagulants (see Interactions).

Administer

- Instruct the client to store pineapple in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use pineapple therapeutically in children or those who are pregnant or breastfeeding until more research is available.
- Advise the client not to use large amounts of pineapple; gastrointestinal upset may occur.

Pipsissewa

(pip-si'suh-wah)

Scientific name: *Chimaphila umbellata*

Other common names: Ground holly, prince's pine, spotted wintergreen, wintergreen

Origin: Pipsissewa is a perennial found in North America, Europe, and Asia.

Uses

Pipsissewa is used as an astringent and antispasmodic, as well as to treat anxiety, seizures, gastrointestinal disorders, and kidney stones. The most common use is as a urinary antiseptic. It is used topically to treat decubitus ulcers, venous statis ulcers, and superficial wounds.

Investigational Uses

Pipsissewa is used experimentally as a treatment for diabetes and urinary tract infections.

Actions

Very little information is available for pipsissewa. One study (Hausen et al, 1988) identified a naturally occurring quinone present in pipsissewa. Chimaphilin, a naphthoquinone, was found to cause contact dermatitis. Another older study (Segelman et al, 1969) found pipsissewa to possess hypoglycemic properties. Galván et al (2008) identified the antifungal and antioxidant activity of pipsissewa.

Product Availability

Crude extract

Plant Part Used: Dried herb

Dosages

No published dosages are available.

Contraindications

Until more research is available, pipsissewa should not be used during pregnancy and breastfeeding. It should not be given to children. Persons with peptic or duodenal ulcers, ulcerative colitis, Crohn's disease, diabetes mellitus, gastroesophageal reflux disease, or iron deficiency should not use this herb. Persons who are hypersensitive to pipsissewa should not use it.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, diarrhea, gastrointestinal irritation
INTEG: Hypersensitivity reactions

Interactions

Drug

Minerals: Minerals should be taken 2 hours before or after this herb.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Arbutin		Urinary antiseptic
Naphthoquinone	Chimaphilin	Contact dermatitis; urinary antiseptic; bacteriostatic
Hydroquinone		
Ericolin		
Chlorophyll		
Urson		
Isohomarbutin		
Reinfolin		
Homogentisic acid		
Toluquinol		
Hyperoside		
Taraxasterol		
Nonacosane		
Methyl salicylate		
Mineral		
Pectic acid		
Tannin		
Resin		
Gum		
Starch		
Sugar		

Client Considerations

Assess

- Assess for hypersensitivity reactions and contact dermatitis. If present, discontinue the use of this herb and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store pipsissewa in a cool, dry place, away from heat and moisture.
- Instruct the client to take mineral supplements 2 hours before or after this herb.
- Inform the client that pipsissewa is not for long-term use because of its hydroquinine content. Pipsissewa can cause hydroquinone toxicity (tinnitus, nausea, vomiting, convulsions, collapse).

Teach Client/Family

- Caution the client not to use pipsissewa in children or those who are pregnant or breastfeeding until more research is available.

Plantain

(plan'tuhn)

Scientific names: *Plantago lanceolata, Plantago major, Plantago psyllium, Plantago ovata*

Other common names: Blond plantago, broadleaf plantain, buckhorn, cart tract plant, common plantain, English plantain, flea seed, French psyllium, greater plantain, Indian plantago, lanten, narrowleaf plantago seed, plantain seed, psyllium, ribwort, ripple grass, snakeweed, Spanish psyllium, tract plant, way-bread, white man's foot, wild plantain, wild saso

Origin: Plantain is found worldwide.

Uses

Several different products are derived from plantain. Psyllium is used as a bulk laxative. Other internal uses include treatment for cough, urinary tract conditions, and diarrhea. Two plantain species are used to treat inflammation from burns and wounds. Plantain leaves are used topically for wound healing.

Investigational Uses

Plantain is used experimentally for the treatment of cancer and immunosuppressive disorders.

Actions

Two chemical components of *Plantago media,* verbascoside and homoplantaginin, have shown variable antiproliferative actions (Kunvari et al, 1999). *Plantago lanceolata* has been shown to decrease inflammation in the respiratory tract and may be recommended as a treatment for moderate chronic cough, especially for children (Wegener et al, 1999). One study showed the gastroprotective action of the chemical component polyholozide. This chemical component also has laxative action at higher doses (Hriscu et al, 1990). Another study (Rezaeipoor et al, 2000) has shown suppression of the humoral immune response in rabbits given *Plantago ovato.*

Product Availability

Fluid extract, psyllium seeds, powder, tablets, tincture

Plant Parts Used: Husks, leaves, and seeds depending on product

Dosages

- Adult PO fluid extract: 2-4 ml tid (1 : 1 dilution)
- Adult PO seeds: 7.5 g with several glasses of water

Contraindications

Until more research is available, plantain should not be used during pregnancy and breastfeeding. It should not be used by persons with intestinal obstruction. Persons who are hypersensitive to plantain should not use it.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, flatus, diarrhea, bloating, obstruction
INTEG: Hypersensitivity reactions, dermatitis
SYST: *Anaphylaxis*

Interactions

Drug

Antidiabetics, cardiac agents *(beta-blockers, calcium channel blockers, cardiac glycosides):* Plaintain may increase the effects of antidiabetics, cardiac agents; avoid concurrent use.
Carbamazepine, lithium: Plantain may decrease the effects of carbamazepine, lithium; avoid concurrent use.
Iron salts: Plantain tea may decrease the absorption of iron salts.
Oral medications: Plantain may decrease absorption of all oral medications; separate by several hours.

Herb

Vitamins/minerals: Plantain may decrease absorption.

Food

Nutrients: Plantain with meals may decrease nutrient absorption.

Lab Test

Blood glucose: Plantain may decrease blood glucose testing (theoretical).
Cholesterol: Plantain may decrease total cholesterol, LDL, HDL ratio test results.
Digoxin level: Plantain may cause a false increase in serum digoxin.

Primary Chemical Components and Possible Actions

Chemical Class*	Individual Component	Possible Action
Alkaloid **Flavonoid** **Amino acid**	Verbascoside; Homoplantaginin	Possible antitumor

*Varies depending on species

Continued

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Tannin		
Mucilage		
Polysaccharide		
Lipid		
Glycoside		
Terpenoid		
Polyholozidic		Gastroprotective
Phenylethanoid	Acteoside; Plantamajoside Cistanoside; Lavandulifolioside; Isoacetoside	Inhibits arachidonic acid

Client Considerations

Assess

- Assess for hypersensitivity reactions, which can be severe, including anaphylaxis. If present, plantain should be discontinued and antihistamines or other appropriate therapy administered immediately.
- Assess bowel pattern if using as a bulk laxative.
- Assess medication use (see Interactions).

Administer

- Instruct the client to store plantain in a cool, dry place, away from heat and moisture.
- Instruct the client to take all other medications 2 hours before or 2 hours after this herb to ensure proper absorption.

Teach Client/Family

- Caution the client not to use plantain in those who are pregnant or breastfeeding until more research is available.

Pokeweed

(poek′weed)

Scientific name: *Phytolacca americana*

Other common names: Cancer jalap, cancer root, changras, coakum, crowberry, garget, pigeonberry, pocon, pokeberry, poke salad, redink plant, redwood, scoke, txiu kub nyug, Virginia poke

Origin: Pokeweed is a perennial found in the eastern region of North America.

Uses

Pokeweed has been used as a laxative and an emetic. It is also used to treat pruritus, rheumatic disorders, and upper respiratory tract infections including cough, sore throat, and pharyngitis.

Investigational Uses

Pokeweed is being investigated for its antifungal, antiviral, flu, HSV-1, polio, and antitumor uses.

Actions

Most research available for pokeweed focuses on the antifungal or antiviral actions.

Product Availability

Dried root, extract, powder, tincture

Plant Parts Used: Fruit, leaves, roots, stems

Dosages

Emesis

- Adult PO dried root: 60-300 mg

Other

- Adult PO extract: 0.2-0.5 ml

Contraindications

Pregnancy category is 6; breastfeeding category is 5A.

Because it is teratogenic, pokeweed should not be used during pregnancy. Until more research is available, it should not be used during breastfeeding. Pokeweed should not be given to children; deaths have been reported. Persons who are hypersensitive to pokeweed should not use it.

Side Effects/Adverse Reactions

CNS: Confusion, ataxia, dizziness, headache, weakness, sweating, tremors; *seizures, coma (rare)*

CV: Hypotension, tachycardia (rare)

EENT: Blurred vision, eye itching and irritation, sneezing

GI: Nausea, vomiting, anorexia, diarrhea

INTEG: Hypersensitivity reactions, contact dermatitis

RESP: *Respiratory depression (rare)*

Interactions

Drug

CNS depressants *(alcohol, benzodiazepines, opiates, sedative/hypnotics):* Pokeweed may increase the action of central nervous system depressants; avoid concurrent use.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Saponin	Phytolaccigenin Phytolaccoside A-G	Toxic
Glycoprotein	Phytolaccatoxin; Asparagine; Oxalic acid	
Triterpene glycosides	1, 2, 3, 4, 5, 6	
Tannin		

Continued

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Resin		
Betacyanin	Betanin	
Neo-lignan	Isoamericanol A; Americanol A	
Ferredoxin	Ferredoxin I, II	
Lectin		
Lignan		
Flavonoids	Kaempferol; Quercetin	Antioxidant (Bylka et al, 2001)

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of this herb and administer an antihistamine or other appropriate therapy.
- Assess for the use of central nervous system depressants (see Interactions).
- Assess for toxicity. Deaths have been reported.

Administer

- Instruct the client to store the dried root of pokeweed in a paper or cloth sack, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 6 and breastfeeding category is 5A.
- Warn the client not to give pokeweed to children and to store it out of the reach of children and pets. Poisoning can occur.
- Instruct the client to institute emergency poison treatment in small children who consume even one berry.
- Advise the client not to perform hazardous activities such as driving or operating heavy machinery until physical response to the herb can be evaluated.

Pomegranate

(pahm'uh-gra-nuht)

Scientific name: *Punica granatum*

Other common name: Granatum

Origin: Pomegranate is found throughout the world.

Uses

Pomegranate is used as an anthelmintic for tapeworm and opportunistic intestinal worms, as well as to treat diarrhea. It is also used to treat hemorrhoids, as a gargle for sore throat, and as an abortifacient. Pomegranate may be effective as an antimicrobial, in the treatment of diabetes, and as an antioxidant.

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Actions

The proposed actions for pomegranate include hypoglycemic, antidiarrheal, antimicrobial, and anthelmintic. Blood glucose levels were reduced when the extract was given to hyperglycemic rats (Jafri et al, 2000). Diarrhea was reduced significantly when the extract of pomegranate seeds was given to rats induced with diarrhea by castor oil (Das et al, 1999).

Antimicrobial, Amebicide, and Anthelmintic Actions

Effective antiviral action was shown against genital herpes virus (HSV-2) in cell cultures when pomegranate was used (Zhang et al, 1995). Many herbs grown in Peru were tested against *Vibrio cholerae,* which is prevalent in that part of the world. Tea infusions and decoction of pomegranate showed the best action against this organism (Guevara et al, 1994). Another study evaluated the use of pomegranate root against *Entamoeba histolytica* and *Entamoeba invadens.* The alkaloids of the root showed no amebicide action; however, the tannic acid showed high inhibition of these organisms (Segura et al, 1990). Many herbs have been studied for their anthelmintic action against human *Ascaris lumbricoides.* However, only moderate inhibition has been shown when pomegranate is used in vitro (Raj, 1975).

Other Actions

Pomegranate peel extract has been shown to possess significant antioxidant activity in various in vitro models (Chidambara et al, 2002). One study (Kim et al, 2002) identified the chemoprotective potential of pomegranate for human breast cancer. Another study (Lansky et al, 2007) identified a wide range of clinical applications for the treatment and prevention of cancer and other diseases in which chronic inflammation plays an essential role. Tumor necrosis factor was suppressed in cells in the laboratory by pomegranate (Jung et al, 2006).

Product Availability

Crude herb

Plant Parts Used: Bark, fruit, pell, roots, stem

Dosages

No published dosages are available.

Contraindications

Because it is an abortifacient, pomegranate should not be used therapeutically during pregnancy. Until more research is available, pomegranate should not be used therapeutically during breastfeeding. It should not be given therapeutically to children. Pomegranate should not be used therapeutically by persons with hepatic disease or asthma. Persons who are hypersensitive to pomegranate should not use it.

Side Effects/Adverse Reactions

CV: Decreased blood pressure
GI: Nausea, vomiting, anorexia, *hepatotoxicity*
INTEG: Hypersensitivity reactions
MISC: *Carcinogenic*
Overdose: *Hematemesis, vision disturbance, acidosis, cardiovascular shock, death*

Continued

Interactions

Drug

ACE inhibitors, antihypertensives: Pomegranate juice may increase the action of these agents (theoretical).

Herb

Hypotensive herbs: Pomegranate juice may increase hypotension when used with hypotensive herbs.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid	Pelletierine; Methylpelletierine; Pseudopelletierine; Isopelletierine	Anthelmintic; hypoglycemic; antidiarrheal
Phenol		
Acid	Gallic acid; Ellagic acid	
Monoacylglycerol		
Bark and rinds also contain		
Tannin	Punicalin; Punicalagin; Granatins A, B; Gallaglydilactone; Casuarinin; Tellimagrandin; Corilagin	Antimicrobial

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of this herb and administer an antihistamine or other appropriate therapy.
- Monitor hepatic function tests (ALT, AST, bilirubin) for hepatotoxicity; pomegranate should be discontinued if hepatic function tests are elevated.
- Monitor for overdose symptoms (see Side Effects).

Administer

- Instruct the client to store pomegranate in a sealed container, away from heat and moisture.

Teach Client/Family

- Caution the client not to use pomegranate therapeutically during pregnancy because it is an abortifacient. Until more research is available, caution the client not to use pomegranate therapeutically in children or those who are breastfeeding.

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Poplar

(pahp'luhr)

Scientific names: *Populus alba, Populus tremuloides, Populus nigra*

Other common names: American aspen, black poplar, quaking aspen, white poplar

Origin: Poplar is a tree found in the United States.

Uses

Poplar is used to treat arthritis and other joint conditions, diarrhea, urinary tract infections, colds, cough, flu, and gastrointestinal disorders.

Actions

Very little information on the therapeutic actions of poplar is available. Most studies focus on agricultural rather than medicinal use of the tree. Because of the presence of salicin, a salicylate, many of the actions and uses are the same as commercially prepared salicylates. Only one study could be found for any other actions. In this study the antiviral actions of the poplar tree leaf buds were identified (Amoros et al, 1994).

Product Availability

Dried bark, fluid extract

Plant Part Used: Bark

Dosages

- Adult PO decoction: 2-5 g powdered bark, decocted, tid
- Adult PO fluid extract: 2-5 ml tid (1:1 dilution in 25% alcohol)
- Adult PO powdered bark: 2-5 g tid
- Adult topical: 5 g dried bud per day (Jellin et al, 2008)

P

Contraindications

Until more research is available, poplar should not be used during pregnancy and breastfeeding. It should not be given to children younger than 12 years of age. Persons with hypersensitivity to salicylates, peptic ulcer disease, gastrointestinal bleeding, coagulation disorders, nasal polyps, or asthma should use this herb cautiously. Persons who are hypersensitive to poplar should not use it.

Side Effects/Adverse Reactions

EENT: Tinnitus

GI: Nausea, vomiting, anorexia, *gastrointestinal bleeding, hepatotoxicity*

INTEG: Hypersensitivity reactions, pruritus, rash; contact dermatitis (propolis only)

Interactions

Drug

Anticoagulants *(heparin, salicylates, warfarin):* Poplar may increase bleeding time when used with anticoagulants; avoid concurrent use.

Iron salts: Poplar tea may decrease the absorption of iron salts; separate by 2 hours.

Primary Chemical Components and Possible Actions		
Chemical Class	**Individual Component**	**Possible Action**
Glycoside	Salicin	Salicylate
	Populin; Tremuloidin; Tremulacin	
Tannin		
Triterpene		
Alpha-amyrin		
Beta-amyrin		
Sugar		

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of this herb and administer an antihistamine or other appropriate therapy. Cross-sensitivity may occur with propolis, Peru balsam, salicylates (Jellin et al, 2008).
- Assess for anticoagulant use (heparin, warfarin, salicylates). Concurrent poplar use should be avoided (see Interactions).

Administer

- Instruct the client to store poplar in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use poplar during pregnancy and breastfeeding until more research is available.
- Advise the client not to give poplar to children younger than 12 years of age. Reye's syndrome may occur with viral infections (theoretical).

Poppy

(pah'pee)

Scientific names: *Papaver somniferum, Papaver bracteatum*

Other common names: Great scarlet poppy, opium poppy, poppyseed, thebaine poppy, California poppy

Origin: Poppy is an annual found throughout the world.

Uses

Poppy is used as a sedative, an antitussive, a treatment for diarrhea, and to relax gastrointestinal and smooth muscles. It is also used as an analgesic to treat colic and painful wounds.

Actions

Poppy is used as an illicit drug and to manufacture opiates. It is able to decrease pain impulse transmission at the spinal cord level by interacting with opiate receptors. Although most opiates are now synthetically manufactured, *Papaver somniferum* is still used in some parts of the world for opiate production. One study identified three

compounds present in poppy: narcotine, papaverine, and thebaine (Paul et al, 1996). In the event of testing for the use of illicit drugs, the presence of these three chemicals confirms ingestion of the poppy plant.

Product Availability

None available commercially

Plant Parts Used: Seeds are used in bread and confections

Dosages

- Adult PO tea: 1 cup (2 g herb in 150 ml boiling water 10-15 min, strain) up to qid (Jellin et al, 2008)
- Adult PO liquid extract: 1-2 ml per day (Jellin et al, 2008)

Contraindications

Until more research is available, poppy should not be used during pregnancy and breastfeeding. It should not be given to children. Persons who are hypersensitive to poppy should not use it.

Side Effects/Adverse Reactions

CNS: Clonic twitching, dizziness, weakness, headache, tremors, *central nervous system depression*
GI: Nausea, vomiting, anorexia, abdominal contractions
INTEG: Hypersensitivity reactions, pruritus, rash
RESP: *Respiratory depression*

Interactions

Drug

CNS depressants *(alcohol, barbiturates, benzodiazepines, other opiates, sedative/hypnotics):* Poppy increases central nervous system depression when used with CNS depressants; do not use concurrently.
MAOIs: Poppy may increase the action of MAOIs.

Lab Test

Urine heroin, urine morphine: Poppy may cause a false positive result in urine heroin and urine morphine tests.

Pharmacology

Pharmacokinetics

Very little is known about the pharmacokinetics in humans except when synthetic forms such as morphine are used.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Opiate Narcotine Papaverine Thebaine	Codeine; Morphine	Opiate analgesic
Isoquinoline Alkaloids	Cryptonine	Uterine stimulant (Jellin et al, 2008)

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of this herb and administer an antihistamine or other appropriate therapy.
- Assess for the use of central nervous system depressants, MAOIs (see Interactions).

Administer

- Instruct the client to take poppy PO.

Teach Client/Family

- Caution the client not to use poppy in children or those who are pregnant or breastfeeding until more research is available.

Prickly Ash

(prik'lee ash)

Scientific name: *Zanthoxylum americanum*

Other common names: Angelica tree, northern prickly ash, toothache tree, yellow wood

Origin: Prickly ash is a tree found in the United States.

Uses

Prickly ash is used to treat flatulence, fever, and circulatory disorders such as low blood pressure. Traditionally, prickly ash has been used to treat gastrointestinal disorders and to decrease inflammation resulting from arthritis and rheumatism.

Actions

There are very few research studies on prickly ash. One study (Gessler et al, 1994) identified the antimalarial action of *Zanthoxylum chalybeum.* Forty-three different herbs were tested for their antimalarial activity against *Plasmodium falciparum.* Of these 43 herbs, several plant parts were studied. The four most active herbs in the study were *Cissampelos mucronata, Maytenus senegalensis, Salacia madagascariensis,* and *Zanthoxylum chalybeum.* Another study identified hepatic carcinogen-metabolizing enzymes, among them cytochrome P450 (Banerjee et al, 1994). Researchers concluded that essential oils from prickly ash affect the enzymes present for activation and detoxication of certain antibiotics that use these enzymes in metabolism. Another study identified the reason for toxicity in cattle (Bowen et al, 1996). Toxicity was found to be due to an inhibitory reaction, resulting in hypotension that could be antagonized by calcium and neostigmine. Another study (Bafi-Yeboa et al, 2005) identified antifungal constituents of prickly ash.

Product Availability

Bark, fluid extract, tincture

Plant Parts Used: Bark, berry

Dosages

- Adult PO bark: 1-3 g dried bark (Jellin et al, 2008)
- Adult PO bark decoction: 1-3 g dry bark in water, 10-15 min, strain tid (Jellin et al, 2008)
- Adult PO liquid bark extract: (1:1) 1-3 ml tid (Jellin et al, 2008)

- Adult PO bark tincture: (1:5) 2-5 ml tid (Jellin et al, 2008)
- Adult PO liquid berry extract: (1:1) 0.5-1.5 ml (Jellin et al, 2008)

Contraindications

Pregnancy category is 3; breastfeeding category is 2A.

Prickly ash should not be given to children. Persons with peptic or duodenal ulcers, inflammatory conditions of the gastrointestinal tract, or hypersensitivity to this or related herbs should not use prickly ash.

Side Effects/Adverse Reactions

CV: *Hypotension*

GI: Nausea, vomiting, anorexia

INTEG: Hypersensitivity reactions, photosensitivity

SYST: *Bleeding*

Interactions

Drug

Antacids, H_2-blockers, proton pump inhibitors: Prickly ash may decrease the action of these agents (theoretical).

Anticoagulants *(heparin, salicylates, warfarin):* Prickly ash may increase bleeding when used with anticoagulants; avoid concurrent use.

Iron salts: Prickly ash tea may decrease the absorption of iron salts; separate by 2 hours.

Herb

Anticoagulant/antiplatelet herbs: Prickly ash used with anticoagulant/antiplatelet herbs may increase risk of bleeding.

P

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Coumarin	Xanthyletin; Xanthoxyletin; Allo-xanthoxyletin; Dipetaline	Anticoagulant
Ligans	Sesamin; Asarinin	Cytotoxic
Tannin		
Resin		
Alkaloid	Nitidine; Laurifoline	
Volatile oil		
Isoquinoline alkaloid	Berberine	
Furanocoumarin		Antifungal

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of this herb and administer an antihistamine or other appropriate therapy.
- Assess for the use of anticoagulants (heparin, warfarin, salicylates). These drugs should not be used with prickly ash (see Interactions).

Administer

- Instruct the client to store prickly ash in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 2A.
- Caution the client not to give prickly ash to children.

Propolis

(prah'puh-luhs)

Scientific names: Propolis balsam, propolis resin, propolis wax

Other common names: Bee glue, hive dross, Russian penicillin

Origin: Propolis is a natural product of bees.

Uses

Traditionally, propolis has been used to treat inflammation and to promote wound healing. Propolis may be used for tuberculosis and bacterial, fungal, and protozoal infections.

Investigational Uses

Propolis may have antioxidant and antitumor uses. It may also be used as an antiinflammatory to treat a variety of conditions.

Actions

Most of the information on propolis focuses on contact dermatitis, which is quite common. Several articles have been published since 1976 on this hypersensitivity reaction. Most other research focuses on the antimicrobial actions of propolis. Studies have shown antiviral action against herpes simplex virus type I (Amoros et al, 1992), antiinfluenza action (Serkedjieva et al, 1992), and antibacterial actions that are significant and nonspecific (Dimov et al, 1992). Propolis has also been effective against *Streptococcus mutans* present in the mouth (Park et al, 1998). Another proposed action has been antiinflammation (Khayyal et al, 1993).

Product Availability

Tablets 600 mg; capsules 200, 500, 600 mg; topical cream, fluid extract, lozenges, gum, jelly

Plant Part Used: Buds of conifers

Dosages

- Adult PO capsules or tablets: 600 mg daily
- Adult fluid extract: 15-30 gtt mixed in 3-4 oz warm water tid
- Adult topical cream: apply to affected area prn

Contraindications

Until more research is available, propolis should not be used during pregnancy and breastfeeding. It should not be given to children. Persons who are hypersensitive to propolis or bee products should not use it. Those with asthma should not use this product.

Side Effects/Adverse Reactions

GI: Nausea, anorexia, oral mucositis, stomatitis
INTEG: Hypersensitivity reactions, dermatitis, eczema

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Resin		
Wax		
Essential oil		
Pollen		
Flavonoid	Pinocembrin; Pinobanksin; Galangin; Chrysin	Antimicrobial
Prenyl esters	Caffeic acid, Ferulic acid	Antimicrobial
P-coumaric acid		Antimicrobial

Client Considerations

Assess

- Assess for hypersensitivity reactions, contact dermatitis, and oral mucositis. If present, discontinue the use of this herb and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store propolis in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Instruct the client not to use propolis in children or those who are pregnant or breastfeeding until more research is available.

Pulsatilla

(puhl-suh-til′uh)

Scientific name: *Anemone pulsatilla*

Other common names: Crowfoot, Easter flower, kubjelle, meadow anemone, meadow windflower, pasque flower, prairie anemone, smell fox, stor, wind flower

Origin: Pulsatilla is a perennial found in Europe.

Uses

Pulsatilla traditionally has been used as a sedative and diuretic, as well as to treat insomnia, cough, genitourinary disorders, menstrual irregularities, headache, otitis media, and eye conditions including cataract, glaucoma, iritis, and scleritis. Topically, pulsatilla is used for boils and skin eruptions (Jellin et al, 2008).

Actions

Pulsatilla has shown promise in the treatment of otitis media in children. Herbalists have used this plant for many years to treat this condition (Friese et al, 1997). However, little primary research is available to support this use. Protoanemonin is known to be a central nervous system depressant and to induce abortions.

Product Availability

Dried herb, fluid extract, homeopathic products, tincture

Plant Parts Used: Dried leaves, flowers, stems

Dosages

- Adult PO fluid extract: 0.1-0.3 ml tid (1:1 dilution in 25% alcohol)
- Adult PO infusion: 0.1-0.3 g dried herb infusion tid
- Adult PO tea: ½ tsp dried herb in 1 cup boiling water, let stand 15 min, drink tid
- Adult PO tincture: 0.5-3 ml tid (1:10 dilution in 25% alcohol)

Contraindications

Because it is an abortifacient, pulsatilla should not be used during pregnancy. Until more research is available, this herb should not be used during breastfeeding. Persons who are hypersensitive to pulsatilla should not use it.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia; burning of the tongue, throat (chewing)
GU: *Albuminuria, hematuria,* irritation
INTEG: Hypersensitivity reactions
Toxicity: *Seizures, dizziness, blurred vision, sneezing paralysis, irritation of nasal passages and throat, vomiting, abdominal cramping and pain, diarrhea, nephrotoxicity*

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Glucoside	Protoanemonin	Central nervous system depression; abortifacient; sedative antipyretic (Jellin et al, 2008)
Saponin		
Tannin		
Volatile oil		
Acid	Chelidonic acid; Succinic acid	
Flavonoid		
Glucose		

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Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of this herb and administer an antihistamine or other appropriate therapy.
- Assess for toxicity: seizures, dizziness, blurred vision, sneezing paralysis, irritation of nasal passages and throat, vomiting, abdominal cramping and pain, diarrhea, and nephrotoxicity.

Administer

- Instruct the client to store pulsatilla in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use pulsatilla during pregnancy because it is an abortifacient. Until more research is available, caution the client not to use this herb during breastfeeding.
- Because of its toxicity, advise the client not to touch the pulsatilla plant.

Pumpkin

(puhmp'kuhn)

Scientific names: *Cucurbita pepo, Cucurbita maxima, Cucurbita moschata*

Other common names: Cucurbita, pumpkinseed, vegetable marrow

P

Origin: Pumpkin is found in Canada and the United States.

Uses

Pumpkin is used as an anthelmintic, primarily for tapeworms, and to treat benign prostatic hypertrophy (BPH), childhood enuresis, and irritable bladder.

Actions

Pumpkin has been shown to reduce benign prostatic hypertrophy and to decrease human tapeworms, although no studies for either use are available. One study (Tarhan et al, 2007) identified antioxidant properties of the flower extract.

Product Availability

Seed extract, seed oil, seeds, tablets, tea

Plant Part Used: Seeds

Dosages

Anthelmintic

- Adult PO: 20-150 g tid

Dysuria due to BPH

- Adult PO: 5 g of ground seeds bid (Jellin et al, 2008)

Other

- Adult PO seeds: 10 g/day coarsely ground seeds taken with fluids

Contraindications

Until more research is available, pumpkin should not be used therapeutically during pregnancy and breastfeeding. Persons who are hypersensitive to pumpkin should not use it.

Side Effects/Adverse Reactions

ENDO: Electrolyte loss (sodium, potassium chloride)
GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions

Interactions

Drug

Diuretics: Pumpkin may increase the action of diuretics; use together cautiously.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Amino acid	Cucurbitin	
Fatty acid	Oleic acid; Linoleic acid; Palmitic acid; Stearic acid	
Mineral	Calcium; Selenium; Zinc; Copper; Iron; Manganese; Phosphorous; Potassium	
Tocopherol		
Carotenoid		

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of this herb and administer an antihistamine or other appropriate therapy.
- Assess electrolytes levels (sodium, potassium, chloride) if the client is using pumpkin for an extended period to treat BPH.
- Assess for expulsion of worms if the client is using pumpkin as an anthelmintic.

Administer

- Instruct the client to store pumpkin in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use pumpkin therapeutically during pregnancy and breastfeeding until more research is available.

Pycnogenol

Scientific names: Procyanidol oligomers from *Pinus maritima;* also known as *Pinus nigra* var. *maritima*

Other common name: Pine bark

Origin: Pycnogenol is a mixture of bioflavonoids found in pine bark.

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Uses

Pycnogenol is used to treat hypoxia in cardiac or cerebral infarction. It is also used as an antioxidant, an antitumor, and to treat inflammation. Pycnogenol is often used in place of grape seed extract.

Investigational Uses

Research is underway for the uses of pycnogenol in melasma, attention deficit–hyperactivity disorder, gingival bleeding, plaque formation, chronic venous insufficiency, reduction of platelet aggregation, systemic lupus erythematous, and vascular retinopathies.

Actions

Pycnogenol is a mixture of bioflavonoids found in pine. Preliminary research suggests antioxidant and antitumor actions, inhibition of tumor necrosis factor (TNF)-alpha, and inhibition of smoking-induced platelet aggregation. The antioxidant effect, including antiaging, has been evaluated and shown to be significant (Liu et al, 1998). Three studies show the antitumor properties of pycnogenol (Huang et al, 2005; Huynh et al, 1999, 2000). In all three studies, pycnogenol was able to induce death in cancer cells, although one study showed healthy cells intact. There was inhibition of TNF-alpha in human vascular endothelial cells (Peng et al, 2000). In another study, smoking-induced platelet aggregation was inhibited by the use of either 500 mg of aspirin or 125 mg of pycnogenol. Aspirin increased bleeding time; pycnogenol did not (Putter et al, 1999).

Gingival and Antiplaque Actions

One study (Kimbrough et al, 2002) identified the antiplaque action and the minimization of gingival bleeding in participants using chewing gum with pycnogenol. Those subjects using this type of gum showed no increase in plaque formation in 2 weeks.

Attention Deficit–Hyperactivity Disorder

One small study with 24 individuals age 24 to 53 years old were studied in a double-blind, placebo-controlled crossover study with pycnogenol, and methylphenidate, and placebo. The placebo ranked higher on a self-reporting scale (Tenenbaum et al, 2002).

Product Availability

Capsules, tablets

Plant Parts Used: Water-soluble bioflavonoids from pine

Dosages

Chronic Pelvic Pain, Dysmenorrheal, Endometriosis

- Adult PO: 30-60 mg daily (Jellin et al, 2008)

Chronic Venous Insufficiency

- Adult PO: 45-360 mg daily or 100 mg tid (Jellin et al, 2008)

Coronary Artery Disease

- Adult PO: 150 mg tid (Jellin et al, 2008)

Diabetic Retinopathies

- Adult PO: 50 mg tid (Jellin et al, 2008)

Contraindications

Until more research is available, pycnogenol should not be used during pregnancy and breastfeeding. It should not be given to children.

Interactions

Drug

Immunosuppressants: Pycnogenol may interfere with immunosuppressant action (theoretical).

Lab Test

Blood platelet aggregation: Pycnogenol may cause reduced blood platelet aggregation.

Pharmacology

Pharmacokinetics

Metabolized by glucuronide and sulfate conjugation; conjugates are excreted in urine (18-24 hours), metabolites (28-34 hours).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Bioflavonoid	Proanthocyanidins	Antioxidant; antitumor

Client Considerations

Assess

- Assess the reason the client is taking this supplement.

Administer

- Instruct the client to store pycnogenol in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use pycnogenol in children or those who are pregnant or breastfeeding until more research is available.

Pygeum

(pie-jee'uhm)

Scientific name: *Pygeum africanum*

Other common name: African plum tree

Origin: Pygeum is an evergreen found in Africa.

Uses

Pygeum had been used to treat urinary tract infections and benign prostatic hypertrophy (BPH), as well as to increase prostatic secretions. Traditionally, pygeum is used in inflammation, urinary problems, fever, and as an aphrodisiac (Jellin et al, 2008).

Actions

BPH Action

Studies have focused on the use of pygeum as a treatment for BPH. Pygeum both decreases inflammation and gland size and increases prostatic secretions and urinary flow (Levin et al, 1997; Shenouda et al, 2007). Rabbits given pygeum showed a significant decrease in the partial outlet obstruction that occurs with BPH. Other literature review details how several small studies have provided very little viable information for the use of pygeum in BPH. A large-scale study is needed to investigate the usefulness of pygeum (Edgar et al, 2007).

Other Actions

Pygeum may be useful for male sexual dysfunction related to the BPH (Carani et al, 1991). It may also be useful in chronic prostatitis. However, more research will be necessary to confirm these results.

Product Availability

Powder; standardized extract (14% triterpenoids, 0.5% *N*-docosanol)

Plant Part Used: Bark

Dosages

BPH

- Adult PO: 75-200 mg daily may be combined with nettle for increased effectiveness

Contraindications

Pregnancy category is 3; breastfeeding category is 1A.

Pygeum should not be given to children. Persons who are hypersensitive to pygeum should not use it.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, gastrointestinal irritation

INTEG: Hypersensitivity reactions

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Triterpene	Urolic acids; Oleanolic acid; Crataegolic acid	Prostatic antiinflammatory
Fatty acid		
Tannin		
Phytosterol	Beta-sitosterol	Competes with cholesterol; inhibits arachidonic acid metabolites
	Beta-sitosterone; Campesterol	

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of this herb and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store pygeum in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 1A.
- Caution the client not to give pygeum to children.

Queen Anne's Lace

(kween anz lays)

Scientific name: *Daucus carota*

Other common names: Bee's nest, bird's nest, carrot, devil's plague, mother's die, oil of carrot, philatron, wild carrot

Origin: Queen Anne's lace is found in North America.

Uses

Queen Anne's lace has been used as an antibacterial, antispasmodic, antisteroidogenic, to protect the liver, and for hypertension. In children, Queen Anne's lace is used to treat tonsillitis, intestinal parasites (as a tea), and dermatologic conditions such as photodermatosis.

Actions

Queen Anne's lace has shown to be antihypotensive, antispasmodic, antisteroidogenic, hepatoprotective, and bacteriosorbent. The antispasmodic effect was evaluated in different species of animals on smooth muscles of the uterus, blood vessels, ileum, and trachea. It was found to be a smooth muscle relaxant (nonspecific) similar to papaverine, but only one tenth as potent (Gambhirr et al, 1979). The antisteroidogenic action was studied using Queen Anne's lace seeds, which were able to arrest the development of the ovaries and reduce weight in the mouse (Majumder et al, 1997). The hepatoprotective action of Queen Anne's lace was evaluated against carbon tetrachloride intoxication in mouse liver (Bishayee et al, 1995). Hepatic function test results were lowered, and Queen Anne's lace provided significant protection against hepatic damage. The bacteriosorbent action has been shown by induction of agglutination (Bratthall, 1978).

Product Availability

Crude extract, tea

Plant Parts Used: Leaves, roots, seeds

Dosages

- Adult PO tea: 2-4 g steeped in boiling water 5-10 min, strain, tid (Jellin et al, 2008)
- Adult PO liquid extract (1:1): 2-4 ml tid (Jellin et al, 2008)

Contraindications

Until more research is available, Queen Anne's lace should not be used during pregnancy and breastfeeding. Persons who are hypersensitive to Queen Anne's lace should not use it.

Side Effects/Adverse Reactions

CNS: CNS depression, sedation, drowsiness
CV: Hypotension, *cardiac depression*
GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions, contact dermatitis, photosensitivity

Interactions

Drug

Antihypertensives, diuretics: Queen Anne's lace increases hypotension when used with antihypertensives, diuretics; use together cautiously.

Continued

Interactions—cont'd

Cardiac glycosides *(digoxin, digotoxin):* Queen Anne's lace used with cardiac glycosides may increase cardiac depression; avoid concurrent use.
CNS depressants *(alcohol, analgesics, anxiolytics, sedatives):* Queen Anne's lace increases the action of central nervous system depressants; use together cautiously.
Estrogens: Queen Anne's lace may interfere with the action of estrogens.

Herb

Sedative herbs: Queen's Anne's lace with sedative herbs may increase sedation (theoretical).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Sesquiterpenes		
Glucosides		
Flavonoid	Chrysin; Luteolin Apigenin	Antioxidant, Antiinflammatory, Radical scavenger (Kumarasamy et al, 2005) Anxiolytic
Porphyrin		
Furanocoumarin	DC-2,3	Calcium channel blocker
Volatile oil	Pinene; Geraniol; Limonene; Terpinen; Carophyllene; Carotol; Daucol; Asarone; Dipentin; P-cymene	
Seeds also contain		
Fatty acid	Oleic acid; Linolenic acid; Palmitic acid	

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of this herb and administer an antihistamine or other appropriate therapy.
- Assess for medication use (see Interactions).

Administer

- Instruct the client to store Queen Anne's lace in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use Queen Anne's lace during pregnancy and breastfeeding until more research is available.

- Advise the client to stay out of the sun or to use protective clothing. Queen Anne's lace causes increased photosensitivity.
- Advise the client not to perform hazardous activities such as driving or operating heavy machinery until physical response to the herb can be evaluated.

Quince

(kwins)

Scientific name: *Cydonia oblonga*

Other common names: Common quince, golden apple

Origin: Quince is found in Southwest and Central Asia and in Europe.

Uses

Quince traditionally has been used to treat diarrhea, gonorrhea, dysentery, *Candida* infections of the mouth, and sore throat. It is also a component in lotions, creams, and mouthwash. Quince is used topically to treat canker sores and gum disease.

Investigational Uses

Researchers are experimenting with the use of quince as an antibacterial and to treat cancer.

Actions

The variety of quince that is common in Peru has been shown to be effective against *Vibrio cholerae* when tested with several other herbs (Guevara et al, 1994). Traditional literature shows actions for cardiac and renal effects. Most of this literature is based on anecdotal reports. Primary research is lacking for this herb. New elements of the composition of quince seeds were identified as phenolics, organic acids, and free amino acids (Silva et al, 2005).

Product Availability

Decoction, fruit syrup, mucilage of seeds

Plant Parts Used: Fruit, seeds

Dosages

Diarrhea, Thrush, Gonorrhea

- Adult PO seeds: boil 2 drams in 1 pt water for 10 min; strain
- Adult topical seeds: apply poultice of ground seeds to affected area prn

Contraindications

Until more research is available, quince should not be used during pregnancy and breastfeeding. Persons who are hypersensitive to quince should not use it.

Side Effects/Adverse Reactions

INTEG: Hypersensitivity reactions

SYST: *Toxicity (seeds)*

Continued

Interactions

Drug

Oral medications: Quince may decrease the absorption of all oral medications (Jellin et al, 2008).

Food

Nutrients: Quince may decrease the absorption of nutrients (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Seeds contain		
Phenolics		
Organic acids		
Free amino acids		
Fixed oil		
Protein		
Cyanogenic	Amygdalin	Toxicity
Glycosides	Cyanide	Toxicity

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of this herb and administer an antihistamine or other appropriate therapy.
- Assess for toxicity.

Administer

- Instruct the client to store quince in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use quince during pregnancy and breastfeeding until more research is available.
- Advise the client to store quince out of the reach of children and pets.

Quinine

(kwy′nine)

Scientific name: *Cinchona succirubra*

Other common names: Cinchona, Jesuit's bark, Peruvian bark

Origin: Quinine is a tree found in mountainous tropical regions of the United States.

Uses

Quinine has been used to treat malaria. It has been used in mainstream medicine to treat *Plasmodium falciparum* and nocturnal leg cramps.

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Actions

Quinine inhibits parasite replication and transcription of DNA to RNA by forming complexes with the DNA of the parasite (Andrade-Neto et al, 2003).

Product Availability

Capsules, tablets

Plant Part Used: Bark of 6- to 8-year-old trees

Dosages

Leg Cramps

- Adult PO capsules/tablets: 250-300 mg at bedtime

Other

- Adult PO capsules/tablets: 650 mg q8hr × 10 days, given with pyrimethamine 25 mg q12hr × 3 days and sulfadiazine 500 mg qid × 5 days
- Child PO capsules/tablets: 25 mg/kg/day divided q8hr × 3-7 days

Contraindications

Quinine should not be used during pregnancy and breastfeeding. It should not be used by persons with G6PD deficiency and retinal field changes. Caution should be exercised by persons with blood dyscrasias, severe gastrointestinal disease, neurologic disease, severe hepatic disease, psoriasis, cardiac arrhythmias, and tinnitus. Persons who are hypersensitive to quinine should not use it.

Side Effects/Adverse Reactions

CNS: Headache, stimulation, fatigue, irritability, *seizures,* bad dreams, dizziness, fever, confusion, anxiety
CV: *Angina, arrhythmias, tachycardia, hypotension, acute circulatory failure*
EENT: *Blurred vision, corneal changes, difficulty focusing,* tinnitus, deafness, photophobia, diplopia, night blindness
ENDO: Hypoglycemia
GI: Nausea, vomiting, anorexia, diarrhea, epigastric pain
GU: *Renal tubule damage, anuria*
HEMA: *Thrombocytopenia, purpura, hypothrombinemia, hemolysis*
INTEG: Hypersensitivity reactions, pruritus, pigmentary changes, skin eruptions, lichen planus-like eruptions, flushing, facial edema sweating
RESP: Dyspnea

Interactions

Drug

Acetazolamide, sodium bicarbonate: Quinine used with acetazolamide, sodium bicarbonate may lead to toxicity; do not use concurrently.
Aluminum salts, magnesium: Aluminum salts, magnesium may cause decreased absorption of quinine; separate doses by 3 hours.
Antacids, H_2-blockers, proton pump inhibitors: Quinine may decrease the action of these agents (theoretical).
Anticoagulants *(heparin, salicylates, warfarin)*, ***carbamazepine, cardiac glycosides*** *(digoxin)*, ***neuromuscular blockers:*** Quinine may increase the action of these agents; avoid concurrent use.

Continued

Interactions—cont'd

Herb

Anticoagulant herbs: Quinine and anticoagulant herbs may increase the risk of bleeding (theoretical).

Pharmacology

Pharmacokinetics

PO: Peak 1 to 3 hours; metabolized in the liver, excreted in the urine; half-life is 4 to 5 hours.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid **Quinidine**	Quinine, Cinchonaminone	Parasitic, MAOI Cardiac depressant

Client Considerations

Assess

- Assess for hypersensitivity reactions, itching and skin eruptions. If present, quinine use should be discontinued and an antihistamine or other appropriate therapy administered.
- Monitor hepatic function tests every week (ALT, AST, bilirubin). If elevated, herb use should be discontinued.
- Assess for cinchonism: nausea, blurred vision, tinnitus, headache, and difficulty focusing.
- Monitor blood pressure and pulse. Watch for hypotension and tachycardia.
- Monitor blood studies and complete blood count. Blood dyscrasias can occur.
- Assess for medications used (see Interactions).

Administer

- Instruct the client to store quinine in a sealed, light-resistant container, away from heat and moisture.
- Instruct the client to take quinine 2 hours before or after meals at the same time of day to maintain blood level.

Teach Client/Family

- Caution the client not to use quinine during pregnancy and to avoid its use during breastfeeding.
- Advise the client to avoid the concurrent use of quinine and over-the-counter cold preparations.

Ragwort

(rag'wawrt)

Scientific name: *Senecio jacoboea*

Other common names: Cankerwort, cocashweed, coughweed, dog standard, false valerian, golden ragwort, golden senecio, liferoot, ragweed, St. James wort, staggerwort, stammerwort, stinking nanny, squaw weed, squawroot

Origin: Ragwort is found in North America.

Uses

Ragwort has been used internally to treat menstrual irregularities. Ragwort can be applied topically to stings, leg ulcers, and ulcers of the oral cavity. Only external use is recommended.

Actions

The only documented studies of ragwort focus on its toxicity. Ragwort should not be taken internally for any reason.

Product Availability

Dried herb, fresh herb

Plant Parts Used: Flowers, leaves, seeds

Dosages

- Adult gargle: soak dried herb in warm water, strain, gargle prn
- Adult topical: make poultice from bruised fresh herb added to a little water; apply to affected area prn
- Adult topical: soak dried herb in warm water; apply to affected area prn

Contraindications

Until more research is available, ragwort should not be used internally during pregnancy and breastfeeding. It should not be given internally to children. Persons who are hypersensitive to ragwort or Asteraceae/Compositae family and those with hepatic disease should not use it. Internal use of ragwort is not recommended.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, *hepatotoxicity, hepatic failure (internal use)*

INTEG: Hypersensitivity reactions

Interactions

Herb

Eucalyptus, unsaturated pyrrolizidine alkaloid herb: Ragwort with eucalyptus may increase the risk of pyrrolizidine alkaloid toxicity (theoretical).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Pyrrolizidine alkaloid	Floridanine; Florosenine; Senecionine; Otosenine	Toxic

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, herb use should be discontinued and an antihistamine or other appropriate therapy administered.
- Monitor hepatic function tests (ALT, AST, bilirubin) if ragwort is taken internally. If results are elevated, herb use should be discontinued.

Administer

- Instruct the client to store ragwort in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use ragwort internally in children or those who are pregnant or breastfeeding until more research is available.

Raspberry

(raz′beh-ree)

Scientific name: *Rubus idaeus*

Other common names: Bramble, bramble of Mount Ida, hindberry, red raspberry

Origin: Raspberry is found in Europe, North America, and Asia.

Uses

Raspberry leaves are used to promote diuresis and to treat inflammation and cough. Raspberry may be used topically to treat wounds. Raspberry, like cranberry, is considered useful for the prevention of urinary tract infections and renal calculi. There may be an antimicrobial action in raspberry roots; therefore they are used to promote wound healing and to treat sore throats and canker sores. Raspberry tea is used during pregnancy to relieve morning sickness and to speed and ease labor.

Investigational Uses

Research is underway to confirm the antioxidant use of raspberry and as a gastrointestinal relaxant.

Actions

Raspberry shows antidiabetic and antimicrobial effects. Raspberry is commonly used during pregnancy to relieve morning sickness and to aid in childbirth.

Antimicrobial Action

Twenty-nine Finnish plants were evaluated for their antimicrobial effects. Raspberry was shown to be effective against bacteria only (Rauha et al, 2000). The microbes used in this study were *Aspergillus niger, Bacillus subtilis, Candida albicans, Escherichia coli, Micrococcus luteus, Pseudomonas aeruginosa, Saccharomyces cerevisiae, Staphylococcus aureus,* and *Staphylococcus epidermis.*

Antidiabetic Action

One study evaluated raspberry for use as a treatment for diabetes. In this study, blood glucose levels were reduced significantly in laboratory animals (Briggs et al, 1997).

Antioxidant

One small study identified the antioxidant content of five types of berries by measuring their oxygen radical absorbance capacity. All berries had high antioxidant properties (Wada et al, 2002). Another study (Venskutonis et al, 2007) identified the radical scavenging activity of raspberry.

Product Availability

Capsules, fluid extract, powder, tablets, tea

Plant Part Used: Leaves

Dosages

- Adult PO fluid extract: 4-8 ml tid (1 g leaves/ml 25% alcohol)
- Adult PO powder/tablets: 4-8 g tid

Contraindications

Pregnancy category is 1; breastfeeding category is 2A.

Persons who are hypersensitive to raspberry should not use it. Women with estrogen-sensitive cancers should avoid raspberry leaf (Jellin et al, 2008).

Side Effects/Adverse Reactions

INTEG: Hypersensitivity reactions

Interactions

Drug

Antidiabetics *(acetohexamide, chlorpropamide, glipizide, insulin, metformin, tolazamide, tolbutamide, troglitazone):* Antidiabetics may increase hypoglycemia when used with this herb; monitor blood glucose levels (theoretical).

Calcium, iron salts, magnesium: Raspberry tea may decrease the absorption of these agents.

R

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Leaves contain		
Quercetin		
Rutin		
Flavonoid		
Tannin		Astringent
Fragarin		Mild oxytocic
Acids	Gallic acid; Ellagic acid	
Vitamin	C	
Fruit contains		
Pectin		
Fructose		
Vitamin	C	

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, herb use should be discontinued and an antihistamine or other appropriate therapy administered.
- Monitor blood glucose levels in diabetic clients (see Interactions).

Administer

- Instruct the client to store raspberry in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 1 and breastfeeding category is 2A.

Rauwolfia

(rau-wul'fee-uh)

Scientific name: *Rauwolfia serpentina*

Other common names: Indian snakeroot, snakeroot

Origin: Rauwolfia is found in the Far East, India, and South America.

Uses

Rauwolfia is most often used to treat hypertension. Reserpine, one of its chemical components, is used in mainstream pharmacology, although newer synthetic drugs for hypertension are thought to be more effective. Traditional uses of rauwolfia include treatment for snake bite, insect bites, fever, and dropsy. It is also used to treat nervousness and insomnia.

Actions

Rauwolfia inhibits the release of norepinephrine, depleting norepinephrine stores in adrenergic nerve endings. It has been available in mainstream pharmacology as reserpine for many years. Rauwolfia is used rarely today, except in herbal practice.

Product Availability

Crude herb, fluid extract, injectable (reserpine), powdered extract, suppositories (reserpine), tablets, tea

Plant Part Used: Root

Dosages

- Adult PO: 200-400 mg daily in divided doses; maintenance 50-300 mg daily or in two divided doses (available from a pharmacy with a prescription)
- Adult PO tablets: 600 mg daily (equivalent to 6 mg alkaloids)

Contraindications

Rauwolfia should not be used during pregnancy and breastfeeding. It should not be given to children. Persons who are hypersensitive to rauwolfia or those with depression, suicidal tendencies, active peptic ulcer disease, ulcerative colitis, Parkinson's disease, or pheochromocytopenia should not use it. Clients with seizure disorders or renal disease should use rauwolfia with caution.

Side Effects/Adverse Reactions

CNS: Drowsiness, fatigue, lethargy, dizziness, depression, anxiety, headache, seizures, parkinsonism
CV: Chest pain, *bradycardia, arrhythmias*
GI: Nausea, vomiting, anorexia
HEMA: Purpura, *increased bleeding time, thrombocytopenia*
INTEG: Hypersensitivity reactions, bruising, purpura, ecchymosis

Interactions

Drug

Amphetamines, ephedrine, epinephrine, isoproterenol, norepinephrine: Use of rauwolfia with these agents may cause decreased pressor effects; avoid concurrent use.
Cardiac drugs *(beta-blockers, diuretics):* Use of rauwolfia with cardiac drugs may result in increased hypotension; avoid concurrent use.
Cardiac glycosides *(digoxin):* Use of rauwolfia with cardiac glycosides will cause severe bradycardia, do not use together.
CNS depressants *(alcohol, barbiturates, opioids):* Use of rauwolfia with central nervous system depressants may cause increased CNS depression; avoid concurrent use.
L-Dopa: Use of rauwolfia reduces the effect of L-dopa, with increased extrapyramidal motor symptoms; avoid concurrent use.
MAOIs: Use of rauwolfia with MAOIs may cause excitation and/or hypertension; avoid concurrent use.
Sympathomimetics: Use of rauwolfia with sympathomimetics will increase blood pressure; avoid concurrent use.

Herb

Ephedra: Use of rauwolfia with ephedra may result in decreased pressor effects; avoid concurrent use.

Lab Test

Basal nocturnal acid, gastric analysis, serum/urine sodium: Rauwolfia may cause increased gastric analysis results, basal nocturnal acid output, and serum or urine sodium.
Red blood cells, serum gastrin, urine vanillylmandelic acid: Rauwolfia may cause decreased red blood cells, urine vanillylmandelic acid (VMA), and serum gastrin.

Pharmacology

Pharmacokinetics

Reserpine peaks in 4 hours; duration 2 to 6 weeks; half-life 50 to 100 hours. It is metabolized by the liver, excreted by the kidneys, crosses the blood-brain barrier, and enters breast milk.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Iridoid glucoside	Epiloganin	
Indole alkaloid	Reserpine	Antihypertensive
	Serpentinine; Rescinnamine; Raubasine; Raupine, Methylajmaline, Methylisoajmaline, Hydroxyserpagine, Antileukemic, Yohimbinic acid, Isorauhimbinic acid	
Starch		

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of rauwolfia and administer an antihistamine or other appropriate therapy.
- Monitor cardiac status including blood pressure and pulse; watch for hypotension and bradycardia.
- Assess for bleeding, bruising, ecchymosis, and purpura.
- Assess medications and herbs used. Rauwolfia interacts with many drugs (see Interactions).

Administer

- Instruct the client to store rauwolfia products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use rauwolfia in children or those who are pregnant or breastfeeding.
- Caution clients with depression, peptic ulcer disease, ulcerative colitis, Parkinson's disease, or seizure disorders not to use rauwolfia.
- Advise the client not to perform hazardous activities such as driving or operating heavy machinery until physical response to the herb can be evaluated.
- Advise the client to rise slowly to a standing position to avoid orthostatic hypotension.

Red Bush Tea

(rehd bewsh tee)

Scientific names: *Aspalathus linearis;* also known as *Borbonia pinifolia* and *Aspalathus contaminata*

Other common name: Rooibos tea

Origin: Red bush is a bush found in South Africa.

= Pregnancy = Pediatric = Alert = Popular Herb

Uses

Red bush tea is used as a beverage in place of caffeinated teas.

Investigational Uses

Preliminary research is exploring the antitumor properties of red bush tea and its ability to combat aging in brain tissue. Also being researched is its antihemolytic use.

Actions

Very little research is available for red bush tea. It is known to be high in vitamin C and to contain no caffeine. Initial research is available documenting the antioxidant and antiaging properties of this tea (Sasaki, 1993; Shimoi et al, 1996). In addition, two studies showed that suppression of cancerous cells occurred in mice given *Aspalathus linearis* (Komatsu et al, 1994; Marnewick et al, 2005). Another study showed that red bush tea suppresses HIV infections (Nakano et al, 1997). Simon et al (2000) identified the antihemolytic effect on red blood cells. The degree of inhibition of hemolysis was comparable with the effect of vitamin C.

Product Availability

No commercial products are available.

Plant Part Used: Leaves

Dosages

No published dosages are available.

Contraindications

No absolute contraindications are known.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Vitamin C		Antioxidant
Polysaccharides		HIV inhibition (Jellin et al, 2008)
Flavonoids		
Tannins		

R

Client Considerations

Assess

- Identify the reason the client is using this product.

Administer

- Instruct the client to store red bush tea in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Advise the client that red bush tea may be used as a beverage at any time, that it contains no caffeine, and that it is high in vitamin C.

Rose Hips

(roez hips)

Scientific name: *Rosa canina*

Other common names: Dog brier fruit, dog rose fruit, hipberries, wild brier berries, brier hip, hip, brier rose, eglantine gall, hog seed, dog berry, sweet brier, witches brier, hip tree, hip fruit, hop fruit

Origin: Rose hips is found in Europe, Asia, the United States, and Canada.

Uses

Rose hips is usually taken for its vitamin C content. It is used internally as a diuretic, to prevent and treat colds, flu, vitamin C deficiency, renal and urinary tract disorders, arthritic conditions, rheumatism, gout, and sciatica, and to relieve constipation and increase immunity and capillary strength. Topically, the leaves may be used as a poultice to promote wound healing.

Actions

Very little scientific research is available for rose hips. In one study that identified its allergic properties (Kwaselow et al, 1990), workers exposed to the dust of rose hips developed asthma, rhinitis, and urticaria. Two other studies evaluated the effect of rose hips on cholesterol and triglyceride levels. Hamsters and mice fed rose hips and other fatty acids showed little or no change in the blood levels of these lipids (Gonzalez et al, 1997; Lutz et al, 1993). One study (Ninomiya et al, 2007) found rose hips to be a potent anti-obesity herb because of one of the chemical components, trans-tiliroside.

Product Availability

Capsules, cream, extracts (usually in combination with other products), syrup, tablets, tea, tincture

Plant Parts Used: Fruit, leaves

Dosages

- Adult PO infusion: scald 1-2 g powdered herb and steep 10-15 min, strain
- Adult topical: the leaves can be used as a poultice applied to wounds daily

Contraindications

Until more research is available, rose hips should not be used during pregnancy and breastfeeding. Persons with hypersensitivity to rose hips should not use it.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, diarrhea
INTEG: Hypersensitivity reactions

Interactions

Drug

Iron: Rose hips increases oral iron absorption.
Salicylates: Rose hips can decrease urinary excretion of salicylates.

Lab Test

False negative: A false negative may occur with acetaminophen occult blood.
False increase: A false increase may occur with AST, bilirubin, carbamazepine, creatinine, glucose.

Continued

Interactions—cont'd

False decrease: A false decrease may occur with LDH, theophylline.
Decrease: Rose hips may decrease uric acid.
Increase: Rose hips may increase calcium, sodium.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Kaempferol		
Tannin		
Carotenoid		
Pectin		
Vitamin	C	Antioxidant
	A, B_1, B_2, B_3, E, K	
Acid	Mallic acid, Citric acid, P-coumaric acid	
Flavonoid		
Phenol		
Volatile oil		
Vanillin		
Sugar	Invert sugar; Saccharose	
Trans-tiliroside		Antiobesity

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of rose hips and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store rose hips in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use rose hips during pregnancy and breastfeeding until more research is available.

R

Rue

(rew)

Scientific name: *Ruta graveolens*

Other common names: Herb-of-grace, herbygrass, rutae herba, vinruta

Origin: Rue is found in the Mediterranean, the Americas, Asia, Africa, and Europe.

Uses

Rue traditionally has been used as a sedative, an anthelmintic, and to induce abortion, reduce inflammation in joint disease, relieve menstrual and gastrointestinal disorders, and to treat earaches, snake bite, and insect stings. It may also be used as an abortive agent for contraception. However, supporting evidence for many of these uses is lacking.

Actions

Cardiovascular Action

Rue has been found to produce cardiovascular effects, including hypotension (Chiu et al, 1997). Researchers studied the effects of green beans, common rue, and kelp used concurrently. When rue was tested alone, it was found to exert positive chronotropic and inotropic effects on the right atrium but no effect on atrial tension. This study demonstrates the principle that herbs used in combination often are more potent than a single herb used alone.

Antifertility Action

Rue's postcoital antifertility action was demonstrated in a study using rats and hamsters (Gandhi et al, 1991). Different preparations of *Ruta graveolens* were given orally. The powdered root, aerial parts, and extract of the aerial parts all showed anticonceptive action. None of these was found to be effective in hamsters. However, another study using the roots, stems, and leaf extracts found that all three preparations showed significant antifertility action in rats (Kong et al, 1989).

Antiinflammatory and Analgesic Actions

In one study, plants indigenous to Jordan were studied for their antiinflammatory and analgesic actions. Rue was found to decrease pain in mice (Atta et al, 1998).

Product Availability

Capsules, creams, crude herb, extract, oil

Plant Parts Used: Above-ground parts

Dosages

Earache

- Adult topical oil: pour oil on cotton and insert into affected ear

Toothache

- Adult topical leaves: may be used to fill hollow teeth

Other

- Adult PO capsules: 1 capsule with meals tid
- Adult PO extract: ½-1 tsp with meals tid
- Adult topical cream: apply prn to affected area

Contraindications

Class 2b/2d herb (whole herb).

Because it can cause spontaneous abortion, rue should not be used during pregnancy. Until more research is available, this herb should not be used during breastfeeding and should not be given to children. Persons with hypersensitivity to rue should not use it. Persons with cardiac disease should use rue with caution.

Side Effects/Adverse Reactions

CV: Hypotension
GI: *Spontaneous abortion*
INTEG: Hypersensitivity reactions, photosensitivity, rash, erythema, blisters (topical)
Toxicity: High doses

Interactions

Drug

Antihypertensives: Use of rue with antihypertensives may cause increased vasodilation; avoid concurrent use.
Cardiac glycosides (digoxin): Use of rue with cardiac glycosides may cause increased inotropic effects; avoid concurrent use.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid	Arborine, arborinine, gamma fagarine (Jellin et al, 2008)	
Coumarin	Rutamarin, bergapten, xanthotoxin (Jellin et al, 2008)	Mutagenic, phototoxic
Volatile oil		
Psoralen		
Gamma-fagarine		
Furoquinoline	Dictamnine	
Glycosides	Feruloylsucrose; Methylcnidioside A; Methylpicraquassioside A; Rutin; Picraquassioside (Chen, 2001)	
Chalepensin		Antifertility

R

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of rue and administer an antihistamine or other appropriate therapy.
- Determine whether the client is taking other antihypertensives and/or cardiac glycosides (see Interactions).
- Monitor cardiac status periodically, including blood pressure and pulse.

Administer

- Instruct the client to store rue in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use rue during pregnancy because it can cause spontaneous abortion. Until more research is available, caution the client not to use rue during breastfeeding and not to give it to children.
- Caution the client to avoid using antihypertensives and cardiac glycosides concurrently with this herb (see Interactions).
- Warn the client that rue is toxic at high doses.
- Teach the client to avoid confusion with goat's rue (Jellin et al, 2008).

Safflower

(sa′flau-uhr)

Scientific name: *Carthamus tinctorius*

Other common names: American saffron, azafran, bastard saffron, benibana, dyer's saffron, fake saffron, false saffron, zaffer

Origin: Safflower is found in the Mediterranean, Europe, and the United States.

Uses

Safflower traditionally has been used to treat constipation and fever. Chinese herbalists use it to treat cough, dysmenorrhea, amenorrhea, and other menstrual irregularities. It has also been used as a component in products such as massage oil.

Investigational Uses

Safflower is being tested for its ability to decrease lipids, to treat fatty acid deficiency, and as a COX-2 and prostaglandin inhibitor.

Actions

The studies done on safflower focus on its antiinflammatory, antioxidant, antimycotic, and antihypertensive actions.

Antiinflammatory Action

The antiinflammatory actions of safflower were evaluated by identifying its triterpene content (Akihisa et al, 1996). Significant antiinflammatory properties were found in all flower species evaluated from the Compositae family.

Antioxidant Action

Antioxidant components were isolated from safflower (see chemical properties table) (Zhang et al, 1997).

Antimycotic Action

Researchers screened 56 Chinese herbs for their antimycotic action against *Aspergillus fumigatus, Candida albicans, Geotrichum candidum,* and *Rhodotorul rubra.* Safflower exerted the strongest action against *Aspergillus fumigatus* (Blaszczyk et al, 2000).

Antihypertensive Action

Safflower has been shown to lower blood pressure in hypertensive rats. It is believed to do so by acting on the renin-angiotensin system. Researchers observed a decrease in plasma renin activity and angiotensin II activity (Liu et al, 1992).

Other Actions

When safflower was used with ginseng for breast cancer, all concentrations studied were able to inhibit proliferation in solid tumors (Loo et al, 2004).

Product Availability

Capsules, dried flowers, fluid extract, fresh flowers, tea

Plant Parts Used: Flowers, seeds

Dosages

- Adult PO dried flowers: 3 g tid
- Adult PO extract: 3 g dried flowers/15 ml alcohol/15 ml water, take tid
- Adult PO fresh flowers: 2 tbsp tid

Contraindications

Class 2b/2d herb (flower).

Because it is a uterine stimulant, safflower should not be used during pregnancy. Until more research is available, this herb should not be used during breastfeeding. Persons with hypersensitivity to safflower or Asteraceae/Compositae family should not use it. Persons with bleeding disorders, HIV/AIDS, lupus, decreased immunity, burns, or sepsis should avoid its use.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia

INTEG: Hypersensitivity reactions

Interactions

Drug

Anticoagulants *(heparin, salicylates, warfarin):* Safflower may potentiate anticoagulant action; avoid concurrent use (theoretical).

Immune serums, immunosuppressants, toxoids, vaccines: Use of safflower with immune serums, immunosuppressants, toxoids, and vaccines may cause increased immunosuppression; avoid concurrent use (theoretical).

Herb

Anticoagulant/antiplatelet herbs: Safflower with anticoagulant/antiplatelet herbs may increase the risk of bleeding.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Glycosides	Kaempferol; Acacetin	
Fatty acid	Linoleic acid; Linolenic acid; Oleic acid; Palmitic acid; Steric acid	
Triterpene	Heliaol; Taraxasterol; Psi-taraxasterol; Alpha-amyrin; Beta-amyrin; Lupeol; Taraxerol; Cycloartenol; Enecycloartanol; Tirucalla; Dienol	Antiinflammatory
	Dammaradienol	
Serotonin derivative	Ferulamide; *P*-coumaramide; *Di-p*-coumaramide; Diferulamide	Antioxidant Anticoagulant
Cyclohiptenone Oxide derivative	Cartorimine	

= Pregnancy = Pediatric = Alert = Popular Herb

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of safflower and administer an antihistamine or other appropriate therapy.
- Assess for immunosuppressant medications the client may be taking, such as vaccines, immune serums, toxoids, and immunosuppressants (see Interactions).

Administer

- Instruct the client to store safflower in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use safflower during pregnancy because it is a uterine stimulant. Until more research is available, caution the client not to use this herb during breastfeeding.
- Caution the client to avoid taking immunosuppressants concurrently with safflower (see Interactions).

Saffron

(sa′-fruhn)

Scientific name: *Crocus sativus*

Other common names: Indian saffron, keser, kum kuma, true saffron, Spanish saffron, zaffron

Origin: Saffron is found in Europe and Asia.

Uses

Saffron is primarily used as a flavoring in food. It is used, traditionally, as a sedative and an expectorant, and topically to treat skin disorders.

Actions

Cytotoxic Action

Very little supporting evidence is available for the claims that saffron's chemical components crocine, picrocrocin, and safranal are cytotoxic. However, three studies have shown promise in this area (Aung et al, 2007; Escribano et al, 1996; Nair et al, 1995).

Other Actions

One study (Akhondzadeh et al, 2005) identified saffron as able to decrease mild to moderate depression. This study was a double-blind, randomized, placebo-controlled trial.

Product Availability

Powder

Plant Part Used: Dried tops

Dosage

No published dosages are available. Lethal dose is 20 g.

Contraindications

Saffron should not be given to children or those who are pregnant or breastfeeding. Saffron is an abortifactant. It should not be used in hypersensitivity to saffron or *Lolium, Olea, Salsola* species plants (Jellin et al, 2008).

Side Effects/Adverse Reactions

CNS: Dizziness
CV: Bradycardia
EENT: Epistaxis
GI: Anorexia, nausea, vomiting
INTEG: Flushing of head and face
Reproductive: *Spontaneous abortion*

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Carotenoids	Crocine; Crocetin; Picrocrocin; Safranal Dimethyl-crocetin	Cytotoxic

Client Considerations

Assess

- Assess the reason the client is using saffron.
- Assess for allergy to this herb or *Lolium, Olea, Salsola* species plants.

Administer

- Keep saffron in a cool, dry area, away from excessive light.

Teach Client/Family

- Teach the patient that saffron should not be used in pregnancy because spontaneous abortion may occur. It should not be used in children or breastfeeding until more research is available.

Sage

(sayj)

Scientific name: *Salvia officinalis*

Other common names: Dalmatian, garden sage, meadow sage, scarlet sage, tree sage, common sage, true sage, broad-leafed sage

Origin: Sage is a perennial found in Europe, Canada, and the United States.

Uses

Sage has been used to treat menstrual disorders, diarrhea, sore throat, depression, cerebral ischemia, Alzheimer's disease, gastrointestinal disorders, and gum disease. Topically, sage is used for herpes labialis, laryngitis, stomatitis, and inflammation of

the nose or throat (Jellin et al, 2008). It is also used as a food flavoring and in cosmetics.

Actions

Few studies have been done on the therapeutic uses of sage. Two of its chemical components, labiatic and carnosic acid, have been identified as having antioxidant properties (Leung, 1980). Another study found that sage exerts bactericidal action against a wide range of bacteria (Koga et al, 1999). Gram-negative bacteria death occurred when sage was used. Acute inflammation was decreased when sage was administered to male rats to decrease paw inflammation (Oniga et al, 2007).

Product Availability

Extract

Plant Parts Used: Whole plant

Dosages

Menstrual Irregularities

- Adult PO extract: 1-4 ml (1:1 dilution in 45% alcohol) tid

Sore Throat

- Adult PO extract: 1-4 g as a gargle prn

Contraindications

Pregnancy category is 5; breastfeeding category is 5A.

Sage should not be given to children. Persons with hypersensitivity to sage should not use it, and those with diabetes mellitus and seizure disorders should be monitored closely.

Side Effects/Adverse Reactions

CNS: *Seizures*

GI: Nausea, vomiting, anorexia, stomatitis, cheilitis, dry mouth, oral irritation

INTEG: Hypersensitivity reactions

Interactions

Drug

Anticonvulsants: Sage may decrease the action of anticonvulsants; avoid concurrent use (theoretical).

Antidiabetics, CNS depressants: Sage may increase the action of antidiabetics, CNS depressants.

Iron salts: Sage tea may decrease the absorption of iron salts; separate by 2 hours.

Herb

Hypoglycemic/sedative herbs: Sage may increase the action of hypoglycemic and sedating herbs (theoretical).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil		
Glycosides	Labiatic acid; Carnosic acid; *cis-P*-Coumaric acid; *Trans-P*-Coumaric acid; Luteolin; Hydroxyluteolin; Vicenin-2; Carnosol; Rosmanol; Epirosmanol; Guldosol; Isorosmanol (Miura et al, 2002)	Antioxidant
Tannin	Phenolic acid	Antimicrobial

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of sage and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store sage in a sealed container away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 5 and breastfeeding category is 5A.
- Caution the client not to give sage to children.

SAM-e

Scientific name: *S*-Adenosylmethionine

Origin: SAM-e is found in all living cells and is a precursor in some amino acids.

Uses

SAM-e is used to treat depression, Alzheimer's disease, migraine headache, attention deficit–hyperactivity disorder, chronic hepatic disease, and pain in fibromyalgia. It is also used as an antiinflammatory in osteoarthritis.

Actions

SAM-e plays an important role in normal cell function and survival and is present naturally in the human body. It is necessary for adequate functioning of the central nervous system. SAM-e is considered to be hepatoprotective, as well as an antioxidant and antidepressant. It may also play a role in decreasing *Pneumocystis jiroveci*, improving cognition in Alzheimer's disease, and protecting against coronary artery disease (CAD).

= Pregnancy = Pediatric = Alert = Popular Herb

Antidepressant and Central Nervous System Actions

SAM-e has been shown to be effective in the treatment of depressive disorders by acting on the methylation process in the brain (Bressa, 1994). It also has been shown to be effective in the treatment of Alzheimer's disease, HIV-associated neuropathies, and spinal cord degeneration. Deficiencies of certain vitamins, such as folate and B_{12}, decrease levels of SAM-e. Lowered levels of SAM-e are accompanied by a decrease in serotonin levels, which can lead to depression (Young, 1993). It is thought to increase dopamine and serotonin, as well as other neurotransmitters. One study (Shippy et al, 2004) found that SAM-e was beneficial for depression in those living with HIV/AIDS. Because levels of SAM-e in the cerebrospinal fluid are low in those with neurologic disorders, supplementation may decrease central nervous system symptoms. Initial research has shown positive results in clients with Alzheimer's disease (Lamango et al, 2000; Morrison et al, 1996), *Pneumocystis jiroveci* (Merali et al, 2000), and spinal cord degeneration.

Antiinflammatory Action

The antiinflammatory and analgesic effects of SAM-e have been found to be equal to those of NSAIDs, with many fewer side effects than NSAIDs (Di Padova, 1987). A study using rabbits showed that the addition of SAM-e prevented osteoarthritis (Moskowitz et al, 1973). SAM-e is thought to protect cartilage and to assist in the repair of cartilage.

Hepatoprotective Action

Studies have found that SAM-e decreases hepatic injury associated with alcoholic cirrhosis (Mato et al, 1999). The addition of SAM-e allowed liver transplantation to be delayed in alcoholic cirrhosis.

Other Actions

SAM-e has been found to decrease the intensity of migraine headaches at dosages of 200 to 400 mg twice daily (Gatto et al, 1986).

Product Availability

Capsules, tablets

Dosages

S

Migraine

- Adult PO capsules/tablets: 200-400 mg bid

Contraindications

Until more research is available, SAM-e supplements should not be used during pregnancy and breastfeeding. They should not be given to children. Persons with bipolar disorder or Parkinson's disease should not use SAM-e supplements.

Side Effects/Adverse Reactions

CNS: Headache, dizziness, insomnia, sweating
GI: Nausea, vomiting, anorexia, diarrhea, flatulence

Continued

Interactions

Drug

Antidepressants *(amitriptyline, amoxapine, citalopram, desipramine, doxepin, fluoxetine, fluvoxamine, imipramine, isocarboxazide, naratriptan, nefazodone, nortriptyline, paroxetine, phenelzine, protroptyline, sertraline, sumatriptan, tramadol, tranylcypromine, trimipramiine, venlafaxine, zolmitriptan):* Combining SAM-e with antidepressants may lead to serotonin syndrome; do not use concurrently.

MAOIs: SAM-e may lead to hypertensive crisis when used with MAOIs; do not use concurrently.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Converted to **Cysteine**		

Client Considerations

Assess

- Assess the reason the client is taking SAM-e.
- Assess for depression or bipolar disorder; SAM-e should not be used in these clients as it may precipitate manic episode.

Administer

- Instruct the client to store SAM-e in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use SAM-e supplements in children or those who are pregnant or breastfeeding until more research is available.

Sassafras

(sa'suh-fras)

Scientific name: *Sassafras albidum*

Other Common Names: Ague tree, Bois De sassafras, cinnamon wood, Fenchelholz, *Lignum floridum, Lignum sassafras,* root bark, saloop, sassafrasholz, saxifras

Origin: Sassafras grows wild in the eastern portion of the United States.

Uses

Sassafras has been used, traditionally, for integumentary conditions as an antiseptic, as a tonic, and to treat syphilis.

= Pregnancy = Pediatric = Alert = Popular Herb

Actions

Very little research is available. The few studies that are available focus on sassafras's toxicity. Death can occur with minor amounts of safarole or the quinones, the chemical components of this herb (Craig, 1953; Johnson et al, 2001; Updyke, 1974).

Product Availability

Liquid extract, oil, tea, powder, crude bark

Plant Parts Used: Bark of the roots, stems

Dosages

- Adult PO infusion: use 2-4 g bark tid
- Adult tea: use ¼ tsp of powder to 1 cup boiling water; infuse for 15 min
- Adult liquid extract: 2-4 ml tid (1:1 in 25% alcohol)
- Adult topical: apply oil topically to area

Contraindications

Class 2d (herb).

Until more research is available, sassafras should not be used in pregnancy or breastfeeding. It should not be given to children; death may occur with only a few drops in children. Use is discouraged because the plant is so toxic.

Side Effects/Adverse Reactions

CNS: *CNS depression,* ataxia, dizziness, hallucinations, paralysis, confusion, stupor, spasms, hypothermia
CV: *Cardiovascular collapse*
GI: Nausea, vomiting, anorexia, *hepatic injury/carcinoma*
INTEG: Dermatitis, hypersensitivity to touch
Reproductive: *Spontaneous abortion*
Toxicity: This herb is extremely toxic

Interactions

Drug

CNS depressants: Sassafras may increase the action of central nervous system depressants.

Herb

Sedative herbs: Sassafras may increase the action of sedative herbs.

Lab Test

False positive: A false positive may occur with phenytoin.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Essential oils	Safarole Methyleugenol	Hepatotoxic
Quinones		Hepatotoxic

Client Considerations

Assess

- Assess the reason the client is taking sassafras.

Administer

- Sassafras should be administered only by a qualified herbalist. Most herbalists do not use this herb because of its toxicity.

Teach Client/Family

- Instruct the client never to give sassafras to children or those who are pregnant or breastfeeding.
- Caution the client not to exceed the recommended dosage; do not use long-term.
- Warn the client that this plant is extremely toxic.

Savory

(say'vree)

Scientific name: *Satureja hortensis L.*

Other common names: Bean herb, summer savory, white thyme

Origin: Savory is found in Europe and is cultivated in North America.

Uses

Savory is used to treat indigestion, diarrhea, and other gastrointestinal disorders. Traditionally, savory has also been used to stimulate the libido.

Actions

From research with other herbs, it can be deduced that the chemical components of savory may have the following actions: volatile oil (antibacterial), tannin (astringent), cineole (expectorant), although there is a lack of research to confirm this. One study (Sahin et al, 2003) evaluated the antimicrobial action of *Saturejo hortensis.* It inhibited 23 strains of 11 bacterial species. Another study (Mosaffa et al, 2006) studied the antigenotoxic effects of this herb. The herbal extract was able to reverse the oxidative damage to rat lymphocytes.

Product Availability

Leaves (fresh, dried)

Plant Part Used: Leaves

Dosages

- Adult PO tincture: 1 tsp tid
- Adult PO infusion: 4 tsp of herb in 8 oz of water
- Child PO tincture: ½ tsp tid
- Child PO infusion: 1 tsp of herb in 8 oz of water

Contraindications

Savory should not be used therapeutically in pregnancy or breastfeeding until more research is available. The FDA considers savory to be safe.

= Pregnancy = Pediatric = Alert = Popular Herb

Side Effects/Adverse Reactions

GI: Anorexia
INTEG: Skin eruptions (topical)

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oils		Antibacterial
Tannin		Astringent
Cineole		Expectorant

Client Considerations

Assess

- Assess the reason the client is using savory.

Administer

- Keep savory in a cool, dry area, away from excessive light.

Teach Client/Family

- Teach the client that savory should not be used in pregnancy or breastfeeding until more research is available.

Saw Palmetto

(saw pal-meh'toe)

Scientific names: *Serenoa repens, Sabul serrulata*

Other common names: American dwarf palm tree, cabbage palm, fan palm, IDS 89, LSESR, sabal, scrub palm

S

Origin: Saw palmetto is a palm found in the United States.

Uses

Saw palmetto is primarily used to treat mild to moderate benign prostatic hypertrophy (BPH), stages I, II. It is also used to treat chronic and subacute cystitis; to increase breast size, sperm count, sexual potency; and as a mild diuretic.

Investigational Uses

Research is underway to confirm the use in prostate cancer.

Actions

Benign Prostatic Hypertrophy Action

Saw palmetto has been studied extensively for its use in the treatment of BPH. The herb has been found to decrease both the symptoms of BPH and the swelling of the prostate. A study of a saw palmetto herbal blend versus a placebo noted a decrease in the symptoms and swelling in moderately symptomatic clients with BPH in the experimental group (Marks et al, 2000). Saw palmetto extract was shown to inhibit

alpha 1-adrenoceptors, which may be involved in the production of urinary tract symptoms of BPH (Goepel et al, 1999; Habib et al, 2005). Another study found that saw palmetto exerts a significant effect on urine flow rates and that it is able to control symptoms effectively (Gerber, 2000).

Cytotoxicity in Prostate Cancer

One study (Iguchi et al, 2001) found *Serenoa repens* to be cytotoxic to prostate cancer cells. The chemical component responsible for the cytotoxic action is myristoleic acid. Further research may confirm the use in prostate cancer.

Product Availability

Berries, capsules, fluid extract, tablets, tea

Plant Part Used: Fruit

Dosages

Saw palmetto is standardized to 85% to 95% fatty acids and sterols.

Benign Prostatic Hypertrophy

- Adult PO capsules/tablets: 585 mg up to tid for 4-6 months (Foster, 1998)
- Adult PO fluid extract, standardized: 160 mg bid, or 320 mg daily (Braeckman et al, 1997)
- Adult PO tincture: 20-30 drops up to qid (1:2 dilution) (Foster, 1998)

Other

- Adult PO decoction: 0.5-1 g dried berries tid
- Adult PO decoction: 1-2 g fresh berries tid

Contraindications

Pregnancy category is 3; breastfeeding category is 2A.

Saw palmetto is an antiandrogen herb that is usually given to men. It should not be given to children. Persons with hypersensitivity to saw palmetto should not use it.

Side Effects/Adverse Reactions

CNS: Headache

GI: Nausea, vomiting, anorexia, constipation, diarrhea, abdominal pain and cramping

GU: Dysuria, urine retention, impotence

INTEG: Hypersensitivity reactions

MS: Back pain

Interactions

Drug

Anticoagulants *(anisindione, ardeparin, dalteparin, dicumarol, heparin, warfarin):* Saw palmetto may potentiate the anticoagulant effects of salicylates; avoid concurrent use.

Antiplatelets: Saw palmetto may lead to increased bleeding; avoid concurrent use.

Hormones *(estrogens, hormonal contraceptives, and androgens):* Saw palmetto may antagonize hormone therapy; avoid concurrent use (theoretical).

Immunostimulants: Saw palmetto may increase or decrease the effect of immunostimulants; avoid concurrent use (theoretical).

Interactions—cont'd

NSAIDs *(bromfenac, diclofenac, etodolac, fenoprofen, flurbiprofen, ibuprofen, indomethacin, ketoprofen, ketorolac, meclofenamate, mefenamic acid, nabumetone, naproxen, oxaprozin, piroxicam, sulindac, tolmetin):* Saw palmetto may lead to increased bleeding time; avoid concurrent use.

Lab Test

Bleeding time: Saw palmetto can increase bleeding time.

Semen analysis: Saw palmetto may cause metabolic changes in specimen semen analysis.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Fatty acid	Lauric acid; Myristic acid; Myristolenic acid	Cytotoxic
Phytosterol		
Polysaccharide	Invert sugar; Galactose; Arabinose	
Steroid		
Flavonoid		
Tannin		
Volatile oil		
Acylglyceride	Monolaurin; Monomyristin (Shimada et al, 1997)	

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of saw palmetto and administer an antihistamine or other appropriate therapy.
- Assess the client's urinary patterns, including retention, frequency, pain, urge, residual urine, and nocturia.
- Assess for the use of antiinflammatories, hormones, and immunostimulants (see Interactions).

Administer

- Instruct the client to store saw palmetto products in a cool, dry place, away from heat and moisture.
- Saw palmetto should be taken with meals to minimize gastrointestinal symptoms.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 2A.
- Caution the client not to give saw palmetto to children.
- Advise the client who is taking saw palmetto for BPH to consult a qualified herbalist for supervision.
- Advise the client to obtain a prostate specific antigen (PSA) test before using this herb.

Schisandra

(shi-sahn′druh)

Scientific name: *Schisandra chinesis*

Other common names: Gomishi, omicha, schizandra, TJN-101, wu-wei-zu

Origin: Schisandra is found in the Far East and Russia.

Uses

Schisandra has been used in Chinese medicine for the treatment of respiratory, hepatic, and renal disorders. It is thought to possess both antioxidant and immunostimulant properties. It may also be used to enhance athletic performance and energy.

Actions

Hepatoprotective and Regenerative Actions

Most of the research on schisandra focuses on its hepatoprotective and regenerative functions. Two studies have focused on rats with carbon tetrachloride–induced hepatotoxicity (Zhu et al, 1999, 2000). One study evaluated results of hepatic function tests and pharmacokinetics, and both documented significant improvement in damaged livers after administration of schisandra. Another older study showed that lignan, a compound found in schisandra fruits, was able to stimulate partial liver regeneration after rats were given carbon tetrachloride (Takeda et al, 1987).

Product Availability

Capsules, dried fruit, extract, liquid, tincture, tablets, powder

Plant Parts Used: Fruit, kernel, stems

Dosages

- Adult PO extract: 100 mg bid

Hepatitis

- Adult PO standardized extract: 20 mg lignan content daily (Jellin et al, 2008)

Improving Mental/Physical Performance

- Adult PO: 500 mg-2 g daily or crude herb 1.5-6 g daily (Jellin et al, 2008)

Contraindications

Pregnancy category is 2; breastfeeding category is 1A.

Schisandra should not be given to children. Persons with hypersensitivity to schisandra should not use it.

Side Effects/Adverse Reactions

CNS: *Central nervous system depression (rare)*

GI: Nausea, vomiting, anorexia

INTEG: Hypersensitivity reactions

Interactions

Drug

Immunosuppressants *(azathioprine, basiliximab, corticosteroids, daclizumab, muromonab, mycophenolate, tacrolimus):* Schisandra may decrease the effectiveness of immunosuppressants; avoid use before, during or after transplant surgery.

Interactions—cont'd

Lab Test

ALT, AST: Schisandra may cause decreased ALT and AST.

Pharmacology

Pharmacokinetics

Metabolized by the liver.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Triterpenoids	Manwuweizic acids; Nigranoic acid; Schisandronic acid	Cytotoxic
Ligans	Schizandrin B Schisantherin Schizandrol	Hepatoprotective
Sterol		
Vitamin	A; C; E	
Tannin		
Acid	Malic acid; Tartaric acid; Citric acid	
Resin		

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of schisandra and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store schisandra products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 2 and breastfeeding category is 1A.
- Caution the client not to give schisandra to children.

S

Senega

(seh'ni-guh)

Scientific name: *Polygala senega*

Other common names: Milkwort, mountain flax, northern senega, polygala root, rattlesnake root, seneca, seneca root, seneca snakeroot, senega root, senega snakeroot, seneka

Origin: Senega is a perennial found in the United States and Canada.

Uses

Senega has widely varied uses, including treatment for snakebite, cough, bronchitis, asthma, croup, pharyngitis, and other respiratory conditions. It is also used to induce vomiting and to treat skin disorders.

Actions

Hypoglycemic Action

The hypoglycemic action of senega results from the chemical component senegin, a saponin (Kako et al, 1996). The rhizomes appear to contain the chemical responsible for the hypoglycemic action.

Increased Immune Response

One study determined that the saponins in senega increase specific immune responses and act as vaccine adjuvants (Estrada et al, 2000).

Sedative Action

Sedative-like effects observed in laboratory animals may be due to the actions of the saponins found in senega (Carretero et al, 1986).

Product Availability

Dried powdered root, extract, syrup, tea, tincture

Plant Part Used: Dried root

Dosages

Expectorant

- Adult PO tea: 1 cup bid-tid

Other

- Adult PO dried powdered root: 0.5-1 g tid
- Adult PO extract: 0.3-1 ml q4hr prn
- Adult PO syrup: 2 tbsp q4hr prn
- Adult PO tincture: 2.5-5 ml q4hr prn

Contraindications

Until more research is available, senega should not be used during pregnancy and breastfeeding. It should not be given to children. Senega should not be used by persons with hypersensitivity to this herb or salicylates. Clients with peptic or duodenal ulcers, central nervous system depression, or gastritis also should not use senega.

Side Effects/Adverse Reactions

CNS: Dizziness, lethargy, anxiety
EENT: Blurred vision
GI: Nausea, vomiting, anorexia, abdominal pain, diarrhea
INTEG: Hypersensitivity reactions

Interactions

Drug

Anticoagulants *(heparin, warfarin, salicylates):* Senega may increase bleeding time when used with anticoagulants; avoid concurrent use.
Antidiabetics *(insulin):* Senega may decrease the effects of antidiabetics; avoid concurrent use.

Interactions—cont'd

CNS depressants *(alcohol, barbiturates, benzodiazepines, opiates, sedatives/hypnotics):* Use of senega with CNS depressants may cause increased central nervous system effects; avoid concurrent use.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Saponin	Presenegin; Polygalic acid Senegin	 Hypoglycemia
Salicylate	Methyl salicylate Salicylic acid	Anticoagulant; antiinflammatory
Resin		
Carbohydrate		
Polygalitol		
Alpha-spinasterol		

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of senega and administer an antihistamine or other appropriate therapy.
- Determine whether the client is taking anticoagulants, antidiabetics, or CNS depressants. Drugs in these classes should not be taken concurrently with this herb (see Interactions).

Administer

- Instruct the client to store senega products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use senega in children or those who are pregnant or breastfeeding until more research is available.

S

Senna

(seh′nuh)

Scientific names: *Cassia* spp., *Senna alexandrina*

Other common names: Alexandrian senna, black draught, Dr. Calwell dosalax, Fletcher's Castoria, Gentlax, Khartoum senna, tinnevelly senna

Origin: Senna is found throughout the world.

Uses

Senna is used for bowel preparation before surgery and to treat acute constipation.

Actions

Senna stimulates peristalsis by acting on Auerbach's plexus. It softens the feces by increasing the flow of water and electrolytes into the large intestine. Senna has been used for many years in mainstream pharmacology.

Product Availability

Comminuted herb, decoction, dried extract, elixir, granules (pharmaceutical), oral solution, powder, suppositories, tablets

Plant Part Used: Leaves

Dosages

Preparation for Surgery

- Adult PO black draught: dissolve ¾ oz in 2.5 oz liquid; take between 2 and 4 PM the day before the procedure

Other

- Adult PO cold infusion, comminuted herb: pour cold water over 0.1-0.2 g herb, let stand 10 hr, strain; 1 × dose
- Adult PO granules: add ½-4 tsp granules to water or juice
- Adult PO infusion, comminuted herb: pour hot water over 0.1-0.2 g herb, let stand 10 min, strain; 1 × dose
- Adult suppositories: insert 1-2 suppositories at bedtime
- Adult PO syrup: 1-4 tsp at bedtime (7.5-15 ml)
- Adult PO tablets (Senokot): 1-8 tabs/day
- Child PO syrup >27 kg: use ½ adult dose
- Child PO syrup 1 mo-1 yr: use 1.25-2.5 ml Senokot at bedtime

NOTE: Do not give black draught to children.

Contraindications

Pregnancy category is 1; breastfeeding category is 3A.

Senna should not be given to children younger than 12 years of age unless prescribed by a physician. It should not be used by persons with intestinal obstruction, ulcerative colitis, gastrointestinal bleeding, appendicitis, nausea, vomiting, congestive heart failure, or an acute condition in the abdomen caused by surgery. Persons with hypersensitivity to senna should not use it. This herb should not be used for longer than 1-2 weeks without medical advice.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, cramping, diarrhea, flatulence, *acute liver failure (senna abuse)* (Vanderperren et al, 2005)
GU: Pink, red, brown, or black urine; *renal impairment (senna abuse)*
INTEG: Hypersensitivity reactions
META: Hypocalcemia, enteropathy, alkalosis, hypokalemia, *tetany*

Interactions

Drug

Cardiac glycosides (digoxin): Chronic use of senna may potentiate cardiac glycosides
Disulfiram: Do not use senna with disulfiram (Antabuse).

Interactions—cont'd

Laxatives: Avoid the concurrent use of senna with other laxatives; additive effect can occur.

Herb

Jimsonweed: The action of jimsonweed is increased in cases of chronic use or abuse of senna.

Stimulant laxative herbs: Senna may increase the laxative effect of stimulant laxative herbs.

Lab Test

Serum, 24-hour urine estriol: Senna may cause decreased serum and 24-hour urine estriol.

Pharmacology

Pharmacokinetics

Onset of action 6 to 24 hours; metabolized by the liver; excreted in the feces.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Anthracene	Sennoside A, A_1, B, C, D	Laxative
Sugar	Glucose; Fructose; Sucrose	

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of senna and administer an antihistamine or other appropriate therapy.
- Assess stools for color, consistency, character, and presence of blood and mucus.
- Monitor blood and urine electrolytes if the client is using this product often.
- Determine the cause of constipation (e.g., fluids, bulk, and/or exercise missing from lifestyle).
- Assess for cramping, rectal bleeding, nausea, and vomiting. If these are present, discontinue the use of senna.
- Assess medication and herb use (see Interactions).

Administer

- Instruct the client to store senna products in a sealed container away from heat and moisture.
- Instruct the client to dissolve granules in water or juice before use.
- Instruct the client to shake oral solution before use.

Teach Client/Family

- Inform the client that pregnancy category is 1 and breastfeeding category is 3A.
- Caution the client not to give senna to children younger than 12 years of age.
- Advise the client that the use of laxatives on a regular basis leads to loss of bowel tone.
- Advise the client that urine and feces may turn yellow, brown, or red.
- Advise the client not to use senna if abdominal pain, nausea, or vomiting are present.

Shark Cartilage

(shahrk kahr'tuhl-ij)

Scientific names: *Squalus acanthias* (dogfish shark), *Sphyrna lewini* (hammerhead shark), and others

Origin: Shark cartilage is obtained from the hammerhead and spiny dogfish sharks.

Uses

Investigational Uses

Shark cartilage is primarily used to treat cancer, although research attempting to confirm this use has produced mixed results.

Actions

Shark cartilage has been investigated for its use in the treatment of cancer. However, the only study professing the usefulness of shark cartilage for this purpose has never been replicated. One of the chemical components in the cartilage of the dogfish shark, squalamine, has been shown to possess antibiotic properties (Moore et al, 1993). It is effective against both gram-negative and gram-positive organisms.

Product Availability

Capsules, concentrate, injectable, tablets

Parts Used: Cartilage from the dogfish and hammerhead sharks

Dosages

- Adult injectable ampules: 1 daily
- Adult PO capsules/tablets: 1000-4500 mg daily, usually in divided doses
- Adult PO concentrate: 2 tbsp daily

Contraindications

Until more research is available, shark cartilage should not be used during pregnancy and breastfeeding. It should not be given to children. Shark cartilage should not be used by persons with hepatic disease or by persons who are hypersensitive to it.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, *hepatitis*

Interactions

Drug

Calcium supplements: Shark cartilage combined with calcium may cause increased calcium levels.

Food

Fruit juice *(orange, apple, grape, tomato):* Fruit juice can decrease the action of shark cartilage.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Glycoprotein	Squalamine Sphyrnastatin 1, 2	Antimicrobial

= Pregnancy = Pediatric = Alert = Popular Herb

Client Considerations

Assess

- Monitor hepatic function tests periodically (AST, ALT, bilirubin).

Administer

- Instruct the client to store shark cartilage in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use shark cartilage in children or those who are pregnant or breastfeeding until more research is available.

Siberian Ginseng

(sy-beer′ee-uhn jehn-sing)

Scientific name: *Acanthopanax senticosus, Eleutherococcus senticosus, Hedera senticosa*

Other common names: Devil's shrub, Eleuthro, shigoka, touch-me-not

Origin: Siberian ginseng is a shrub found throughout the world. It is primarily found in Russia and China.

Uses

Siberian ginseng has been used to increase immunity, energy, and performance and to decrease inflammation and insomnia.

Actions

As with ginseng, most of the available research on Siberian ginseng comes from Asia, where it has been studied extensively. In particular, Siberian ginseng has been studied for its adaptogenic, radioprotective, and anticancer actions.

Adaptogenic Action

Siberian ginseng has been found to normalize biologic functioning in a variety of body organs and systems, including the adrenal gland, thyroid, kidneys, white and red blood cells, and blood pressure. The herb also decreases stress reactions in the alarm phase, as seen in stress-induced biologic changes in rats (Brekham et al, 1969).

Radioprotective Action

Siberian ginseng has exhibited protective and therapeutic effects when laboratory animals are exposed to x-ray radiation. In one study in which rats were exposed to prolonged radiation, life spans were more than doubled. Some researchers have suggested that Siberian ginseng may be useful in oncologic treatment to protect patients from the ill effects of radiation therapy (Ben-Hur et al, 1981).

Anticancer Action

In animals, *Eleutherococcus* has decreased thyroid tumors, lung adenomas, and myeloid leukemia. The anticancer action of this herb may be due to its immunostimulant properties (Wagner et al, 1985).

Other Actions

Siberian ginseng possesses a neuroprotective effect by inhibiting inflammation in brain ischemia (Bu et al, 2005).

Product Availability

Capsules, oil, powder, root, tablets, tea, tincture

Plant Parts Used: Root, root bark

Dosages

Some products are standardized to total eleutheroside content or eleutherosides B, D, and E.

Chronic Fatigue Syndrome

- Adult PO dried root: 2-4 g tid (Murray, Pizzorno, 1998)
- Adult PO tincture: 10-20 ml tid (1:5 dilution) (Murray, Pizzorno, 1998)
- Adult PO fluid extract: 2-4 ml (1:1 dilution) (Murray, Pizzorno, 1998)
- Adult PO solid (dry powdered) extract: 100-200 mg (20:1 dilution) standardized to contain >1% eleutheroside E (Murray, Pizzorno, 1998)

General Dosages

- Adult PO capsules/tablets: 500 mg to 2 g daily
- Adult PO extract: 2-12 ml daily (35% alcohol) (McCaleb et al, 2000)
- Adult PO powdered root: 2-8 g (McCaleb et al, 2000)

Contraindications

Pregnancy category is 2; breastfeeding category is 2A.

Siberian ginseng should not be given to children. It should not be used by persons with hypersensitivity to this or other ginseng products or persons with hypertension. Siberian ginseng should not be used for longer than 90 days without a rest period and should not be used during the acute phase of infections, although it can be used concurrently with antiinfectives for dysentery.

Side Effects/Adverse Reactions

CNS: Stimulation, insomnia, dizziness, anxiety, agitation (high doses)
CV: Increased blood pressure (high doses)
GI: Nausea, vomiting, anorexia
GU: Increased vaginal bleeding, increased estrogen levels
INTEG: Hypersensitivity reactions, rash

Interactions

Drug

Antidiabetics *(acetohexamide, chlorpropamide, glipizide, insulin, metformin, tolazumide, tolbutamide, troglitazone),* ***cardiac glycosides*** *(digoxin):* Siberian ginseng may increase levels of antidiabetics, cardiac glycosides; avoid concurrent use.

Cytochrome P450 1A2, 2C9, 2D6, 3A4 substrates: Siberian ginseng (standardized) may inhibit these agents.

Kanamycin: Siberian ginseng may increase the action of kanamycin.

Stimulants *(xanthines):* Concurrent use of stimulants with Siberian ginseng is not recommended; overstimulation may occur.

Herb

Ephedra: Concurrent use of ephedra with Siberian ginseng may increase hypertension and central nervous system stimulation; avoid concurrent use.

Interactions—cont'd

Lab Test

Androstenedione: Siberian ginseng may cause increase in serum androstenedione.

Blood glucose: Siberian ginseng may decrease blood glucose levels.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Saponin	Protoprimulagenin A	
Glycan	Eleutherane A-G	
Eleutheroside	I, K, L, M	Binds to estrogen receptors
Steroid glycoside	Eleutheroside A	
Lignan	Sesamine; Eleutheroside D	
Hydroxycoumarin	Isofraxidin	
Resin		
Vitamin E		

Client Considerations

Assess

- Assess for hypersensitivity reactions, rash. If present, discontinue the use of Siberian ginseng and administer an antihistamine or other appropriate therapy.
- Assess the use of antidiabetics, cardiac glycosides, kanamycin, stimulants, and ephedra (see Interactions).

Administer

- Instruct the client to store Siberian ginseng products in a cool, dry place, away from heat and moisture.
- Instruct healthy clients to use Siberian ginseng for 6 weeks with a 2-week break before repeating (Mills, Bone, 2000), or use for 3 months, then repeat at a later time (German Federal Minister of Justice, 1991).

Teach Client/Family

- Inform the client that pregnancy category is 2 and breastfeeding category is 2A.
- Caution the client not to give Siberian ginseng to children.

S

Skullcap

(skuhl'kap)

Scientific names: *Scutellaria laterifolia, Scutellaria baicalensis*

Other common names: Blue pimpernel, helmet flower, hoodwort, huang-qin, mad-dog weed, madweed, Quaker bonnet, scullcap

Origin: Skullcap is found in North America.

Uses

Skullcap traditionally has been used to treat seizure disorders, inflammation, anxiety, insomnia, nervous tension, spastic disorders, and high cholesterol.

Investigational Uses

Initial research is available for the use of skullcap as an antiviral and as a treatment for lung cancer, cerebrovascular accident (CVA), and embolism.

Actions

Anticancer Action

Skullcap has been shown to normalize platelet-mediated hemostasis in rats with lymphosarcoma (Razina et al, 1989). This action may be responsible for the antitumor effects of skullcap. Another study documented antitumor action and antineoplastic toxicity in mice (Razina et al, 1987).

Sleep Disorder Treatment

Epidemiologic studies have shown the use of skullcap for the treatment of sleep disorders (Cauffield et al, 1999). Skullcap has been shown to decrease interleukin-1 and prostaglandin synthesis (Chung et al, 1995).

Product Availability

Capsules, dried herb tea, fluid extract, tincture

Plant Parts Used: Leaves, roots

Dosages

- Adult PO dried herb tea: 2 g tid
- Adult PO fluid extract: 2-4 ml tid (1:1 dilution in 25% alcohol)
- Adult PO tincture: 1-2 ml tid (1:5 dilution in 45% alcohol)

Contraindications

Class 1 herb (root).
Pregnancy category is 3; breastfeeding category is 2A.
Skullcap should not be given to children. Persons with hypersensitivity to skullcap should not use it.

Side Effects/Adverse Reactions

CNS: *Tremors, confusion, euphoria, seizures, stupor (overdose of tincture only)*
CV: *Arrhythmias (overdose of tincture only)*
GI: Nausea, vomiting, anorexia, *hepatotoxicity*
INTEG: Hypersensitivity reactions

Interactions

Drug

CNS depressants *(alcohol, barbiturates):* Skullcap may potentiate sedation of central nervous system depressants; avoid concurrent use.
Immunosuppressants *(cyclosporine):* Use of skullcap may decrease the effects of immunosuppressants; avoid concurrent use.

Herb

Sedative herbs: Skullcap with sedative herbs can increase sedation (theoretical).

Interactions—cont'd

Lab Test

ALT, AST, total and urine bilirubin: Skullcap may cause increased ALT, AST, total bilirubin, and urine bilirubin.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Flavonoid	Baicalin	Anti-HIV, antineoplastic, antioxidative (Kowalezyk et al, 2006)
	Luteolin; Apigenin; Hispidulin; Baicalein; Scutellarin; Scutellarein	
Iridoid	Catalpol	
Sesquiterpene	Terpineol; Limonene; Caryophyllene; Cadinene	
Tannin		
Resin		
Lignin		
Wogonin		

Client Considerations

Assess

- Assess for hepatotoxicity, central nervous system overdose symptoms, and cardiovascular overdose symptoms (see Side Effects).
- Assess for hypersensitivity reactions. If present, discontinue the use of skullcap and administer an antihistamine or other appropriate therapy.
- Assess for the use of immunosuppressants (see Interactions).

Administer

- Instruct the client to store skullcap products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 2A.
- Caution the client not to give skullcap to children.

S

Slippery Elm

(sli'puh-ree ehlm)

Scientific names: *Ulmus rubra, Ulmus fulva*

Other common names: American elm, Indian elm, moose elm, red elm, sweet elm

Origin: Slippery elm is found in North America.

Uses

Slippery elm is taken internally to treat cough and gastrointestinal conditions including gastritis and gastric or duodenal ulcers. Topically, it is used for its skin smoothing effect and as a poultice to treat skin inflammation, wounds, and burns.

Actions

Very little information is available for slippery elm, other than anecdotal reports. Herbalists continue to use this product to treat cough and gastrointestinal conditions, and for wound healing.

Product Availability

Fluid extract, powdered bark

Plant Part Used: Inner bark

Dosages

- Adult PO: place 4 g in ½ L boiling water; may be taken tid
- Adult PO fluid extract: 5 ml tid
- Adult PO powdered bark decoction: 4-16 ml tid
- Adult topical poultice: mix boiling water with coarse powdered bark to make a poultice; apply to affected area prn

Contraindications

Class 1 herb (bark).

Because it may cause spontaneous abortion, slippery elm should not be used during pregnancy. Until more research is available, this herb should not be used during breastfeeding and should not be given to children. Persons with hypersensitivity to slippery elm should not use it.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia
GU: *Spontaneous abortion (whole bark)*
INTEG: Hypersensitivity reactions

Interactions

Drug

Iron salts: Slippery elm tea may decrease the absorption of iron salts; separate by 2 hours.
Oral medications: Slippery elm may decrease absorption of oral medications (theoretical).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Tannin		Wound healing; astringent
Hexose **Pentose** **Methylpentose** **Polyuronide**		

= Pregnancy = Pediatric = Alert = Popular Herb

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Sterol	Citrostandienol; Dolichol; Phytositosterol	
Sesquiterpene		
Mineral	Calcium oxalate	

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of slippery elm and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store slippery elm products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use slippery elm during pregnancy because it may cause spontaneous abortion. Until more research is available, caution the client not to use this herb during breastfeeding and not to give it to children.

Sorrel

(saw′ruhl)

Scientific name: *Rumex acetosa.* Do not confuse with yellow dock *(Rumex crispus)*

Other common names: Cuckoo's meate, cuckoo sorrow, dock garden sorrel, green sorrel, sour dock

S

Origin: Sorrel is found in Europe and Asia.

Uses

Sorrel is used as a diuretic, an antiseptic to treat skin infections, for sinusitis, and to stimulate secretions. It has been used traditionally to treat scurvy.

Actions

Research regarding sorrel's actions is lacking. This herb is not used commonly because it is considered toxic to the liver and renal system with the presence of potassium oxalates. One study (Lee et al, 2005) identified the chemical constituents, anthraquinones, in *Rumex acetosa* that are cytotoxic and antimutagenic.

Product Availability

Liquid, tea, fresh juice

Plant Parts Used: Flowers, leaves

Dosage

No published dosages are available.

Contraindications

Sorrel should not be used in children or those who are pregnant, breastfeeding, or hypersensitive to this product.

Side Effects/Adverse Reactions

CV: *CV damage*
EENT: Stomatitis
GI: Anorexia, nausea, gastritis, abdominal cramps, *hepatic dysfunction*
GU: *Renal damage*
INTEG: Rash, contact dermatitis

Interactions

Drug

Calcium, iron, zinc: Sorrel may decrease absorption of these minerals.
Diuretics: Sorrel combined with diuretics will lead to an additive diuretic effect; avoid concurrent use.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Oxalates	Potassium	Hepatotoxic
Tannin		Astrigent, wound healing
Anthracene		
Oxymethylanthraquinone		

Client Considerations

Assess

- Assess the reason the client is using sorrel.

Administer

- Keep sorrel in a cool, dry area, away from excessive light.

Teach Client/Family

- Advise the client not to use sorrel in children or those who are pregnant or breastfeeding until more research is available.
- Warn the client that sorrel is fatal at levels over 5 g. Keep away from children and pets.

Soy

(sawee)

Scientific name: *Glycine max*
Other common names: Soya, soybean, soy lecithin

Origin: Soy is a bean found throughout the world.

= Pregnancy = Pediatric = Alert = Popular Herb

Uses

Soy has been used for thousands of years in China. Currently it is used to lower cholesterol and to treat hyperactivity, fever, headache, anorexia, chronic hepatitis, and other hepatic disease.

Investigational Uses

Research supports the use of soy for the treatment of the symptoms of menopause, as well as for the prevention of osteoporosis and various types of cancer (primarily uterine, breast, prostate, and colon cancers).

Actions

Soy is one of the few natural products that has been researched extensively. Although originally used as a food source, in the last few years soy has been found to possess medicinal properties.

Phytoestrogen Action

The isoflavones in soy are chemically similar to estradiol in the female human body. Research has shown that soy is useful for the prevention of symptoms of menopause in perimenopausal women. Studies document that soy lessens these symptoms and provides an alternative to hormone replacement therapy. One study also shows that bone loss in the spine decreases with the addition of soy-rich products to the diets of perimenopausal women (Alekel et al, 2000).

Anticancer Action

Several studies have evaluated the use of soy for treatment of cancer of the breast, prostate, and colon. Populations in Asia with high-soy diets have been found to have a significantly lower incidence of these cancers than other populations. Genistein, one of the chemical components of soy, has been found to decrease the growth of tumors implanted in mice (Record et al, 1997). Soy has been found to lengthen the menstrual cycle by prolonging the follicular phase, which may protect against breast cancer. A recent study postulates that the isoflavones and other chemical constituents of soy may lower the cancer risk of postmenopausal women by altering estrogen metabolism such that genotoxic metabolites are converted to inactive metabolites (Xu et al, 2000). In addition, genistein has been shown to decrease prostatic cancer and to increase the immune response in laboratory animals (Zhang et al, 1997).

Antilipidemia Action

Most of the research on soy deals with its anticholesterol effects. Soy has been found to lower both LDL and total cholesterol levels, with total cholesterol reduction as much as 20% (Anderson et al, 1995). Researchers have documented a slight increase in HDL levels, but not significant. In another study, 32 clients with coronary artery disease discontinued their antilipidemic medication and began a vegetarian diet containing soy-based products. LDL levels dropped significantly, with those who stayed on the diet longer experiencing more significant results (Medkova et al, 1997).

Product Availability

Bean curd, capsules, seitan, soy milk, tofu

Plant Part Used: Bean (seed)

Dosages

Menopause Symptom Relief

- Adult PO: 50-75 mg isoflavones daily (Murray, Pizzorno, 1998)

Osteoporosis Prevention

- Adult PO: 55-100 mg isoflavones daily (Murray, Pizzorno, 1998)

Reduction of Cholesterol

- Adult PO: 25-50 g daily (Murray, Pizzorno, 1998)

Contraindications

No absolute contraindications are known.

Side Effects/Adverse Reactions

GI: Nausea, bloating, diarrhea, abdominal pain
INTEG: Hypersensitivity reactions

Interactions

Drug

Estrogens, tamoxifen, thyroid agents *(dextrothyroxine, levothyroxine, liothyronine, liotrix, thyroglobulin):* Soy may interfere with absorption of these agents; avoid concurrent use.

Lab Test

HDL: Soy may cause increased HDL cholesterol.
LDL, triglycerides, total cholesterol: Soy may cause decreased LDL cholesterol, triglycerides, and total cholesterol.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Isoflavone	Daidzein Genistein	Phytoestrogen Antitumor; impairs thyroid function
Phospholipid	Phosphatidylcholine; Phosphatidylethanolamine; Phosphatidylinositol	
Sterol		
Protein		
Saponin		
Fatty acid	Palmitic acid; Palmitoleic acid; Linoleic acid; Linolenic acid; Steric acid; Oleic acid	
Oxalates		

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of soy and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store soy products in a cool, dry place, away from heat and moisture.

Spirulina

(speer-ew-leen′uh)

Scientific name: *Spirulina* spp. (approximately 35 species)

Other common names: Blue-green algae, DIHE, tecuitlatl

Origin: Spirulina is an alga found in oceans in the tropics and subtropics.

Uses

Because of its high nutritional value, spirulina has been used both to promote weight gain in malnourished clients, to promote weight loss, and for oral leukoplakia.

Investigational Uses

Initial research supports the use of spirulina as an antiviral, a chemoprotective agent, for fibromyalgia, and to decrease cholesterol.

Actions

Spirulina has been used for centuries in South America and Africa. It has been found to possess antiviral, antitumor, anticholesterol, and immunologic properties. Very little research has been done with humans, but animal studies show little toxicity, even at very high amounts (Chamorro et al, 1996).

Antiallergy Action

One study evaluated the use of spirulina for the treatment of allergic reactions. Spirulina was found to decrease mast cell–mediated allergic reactions (Kim et al, 1998).

Antitumor Action

Spirulina has also been shown to decrease induced tumor necrosis factor (TNF)-alpha.

Iron Storage During Pregnancy

Another study using laboratory rats has shown that a diet of spirulina or spirulina plus wheat gluten promoted greater iron storage and a higher hemoglobin content during pregnancy (Kapoor et al, 1998).

Other Actions

Spirulina extract given 250 mg plus zinc 2 mg bid ×16 wk may be helpful for chronic arsenic poisoning (Misbahuddin et al, 2006). Another study (Khan et al, 2006) identified spirulina's protective effect against nephrotoxicity.

Product Availability

Capsules, component in drinks, fresh plant, powder, tablets

Plant Part Used: Whole plant

Dosages

- Adult PO: 3-5 g daily before meals

Malnourishment

- Infant PO: 3-15 g daily

Contraindications

Until more research is available, spirulina should be used with caution during pregnancy and breastfeeding. Caution should be used when giving spirulina products to children. Clients with thyroid conditions should not use spirulina. Heavy metal poisoning may result from high mercury content in some spirulina products.

Continued

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions

Interactions

Drug

Thyroid hormones: The high iodine content of spirulina may decrease the action of thyroid hormones; avoid concurrent use (theoretical).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Amino acid	Phenylalanine	
Fat		
Carbohydrate		
Mineral	Calcium; Potassium; Magnesium; Iron	
Trace element	Selenium; Manganese; Zinc	
Vitamin	B_1; B_{12}; E	
Fatty acid	Gamma-linolenic acid (GLA)	
Nucleic acid		Increased uric acid levels

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of spirulina and administer an antihistamine or other appropriate therapy.
- Assess nutritional status if the client is using spirulina to treat malnourishment.

Administer

- Instruct the client to store spirulina products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Advise the client to use spirulina with caution in children and those who are pregnant or breastfeeding until more research is available.
- Advise the client that some spirulina products may have a high mercury and radioactive ion content.
- Inform the client that the protein content of spirulina is higher than the protein content of evening primrose oil.
- Inform the client that the iron content of spirulina is more easily absorbed than that of many other iron products.

Squill

(skwil)

Scientific names: *Urginea maritima, Drimia maritima*

Other common names: European squill, Indian squill, Mediterranean squill, red squill, scilla, sea onion, sea squill, white squill

Origin: Squill is found in Europe and Mediterranean regions.

Uses

Traditionally, squill has been used for its cardiac glycoside effect in the treatment of cardiac conditions such as congestive heart failure. It is also used to treat cough and to promote diuresis.

Actions

In North Africa, squill has been found to be poisonous to livestock, with ingestion of the plant leading to cardiac toxicity (El Bahri et al, 2000). Toxicity was also reported in a 55-year-old woman with Hashimoto thyroiditis who was taking squill to treat arthritis. Her symptoms were those of cardiac glycoside toxicity (Tuncok et al, 1995). Squill has exerted cardiac glycoside effects in humans but is considered to be milder than current cardiac glycoside prescription drugs (Stauch et al, 1977).

Product Availability

Dried bulb, extract, tincture

Plant Part Used: Bulb

Dosages

- Adult PO decoction: pour 8 oz boiling water over 1 tsp dried bulb, let stand 15 min, allow to cool; may be taken tid
- Adult PO tincture: ½-1 ml tid

Contraindications

Until more research is available, squill should not be used during pregnancy and breastfeeding. It should not be given to children. Squill should not be used by persons with hypokalemia, hypertropic cardiomyopathy, sick sinus syndrome, ventricular tachycardia, or second or third-degree heart block. Persons who are hypersensitive to squill should not use it.

Side Effects/Adverse Reactions

CNS: Anxiety, headache, tremors, central nervous system stimulation, *seizures*
CV: *Arrhythmias, heart block, asystole*
GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions

Interactions

Drug

Cardiac agents *(antiarrhythmics, beta-blockers, calcium channel blockers, cardiac glycosides):* Squill may increase the effects of cardiac agents, causing life-threatening toxicity; do not use concurrently.

Continued

Interactions—cont'd

CNS stimulants *(amphetamines, cerebral stimulants),* ***glucocorticoids, laxatives:*** Squill may increase the effects of central nervous system stimulants, glucocorticoids, laxatives; avoid concurrent use.
Iron salts: Squill may decrease the absorption of iron salts; separate by 2 hours.

Lab Test

Red blood cells: Squill may cause a decrease in red blood cells.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Cardiac glycoside	Proscillaridin A; Scillaren A, B; Glucoscillaren; Scillaridin A; Scilliroside	Inotropic; Chronotropic
Flavonoid		
Bufadienolides		
Ligan		

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of squill and administer an antihistamine or other appropriate therapy.
- Assess cardiac status (blood pressure, pulse, possibly ECG) if the client is taking squill over an extended period of time.
- Monitor electrolytes and watch for decreasing potassium levels.
- Determine whether the client is taking other cardiac medications such as beta-blockers, calcium channel blockers, cardiac glycosides, and antidysrhythmics. This herb should not be used with these medications (see Interactions).
- Assess for the use of central nervous system stimulants, glucocorticoids, and laxatives (see Interactions).

Administer

- Instruct the client to store squill products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use squill in children or those who are pregnant or breast-feeding until more research is available.
- Advise the client that other, more mainstream agents are available and are preferred to squill.

St. John's Wort

(saynt jahnz wawrt)

Scientific name: *Hypericum perforatum* L

Other common names: Amber, goatweed, hardhay, John's wort, klamath weed, mellipertuis, rosin rose, witches' herb

Origin: St. John's wort is found in Europe, Asia, and the United States.

Uses

St. John's wort is used to treat mild to moderate depression and anxiety. It may be used topically as an antiinflammatory to relieve hemorrhoids, as well as to treat vitiligo and burns.

Investigational Uses

St. John's wort is used experimentally to treat warts, Kaposi's sarcoma, cutaneous T-cell lymphoma, and other viruses such as influenzae. It is also used experimentally as an antiretroviral in the treatment of HIV, as an antiinfective against methicillin-resistant strains of *Staphylococcus aureus,* and for phytotherapy in the treatment of psoriasis. Studies are underway to confirm St. John's wort's use in menopausal symptoms and seasonal affective disorder. It may be effective for nicotine withdrawl symptoms.

Actions

Several different possible actions have been researched in the United States and abroad, primarily in the 1980s and 1990s.

Antidepressant Action

The inhibition of MAO (monoamine oxidase) and COMT (catechol *O*-methyl-transferase) by *Hypericum* extracts and hypericin was researched (Bladt, Wagner, 1994; Suzuki et al, 1984; Thiede et al, 1994). Hypericin was found to inhibit in vitro type A and B MAOs. In rats, MAO-A inhibition was greater than MAO-B inhibition (Suzuki et al, 1984). No relevant MAO inhibitory effect could be shown from the results of (Bladt, Wagner, 1994), and no MAOI reactions have ever been found with St. John's wort. The inhibition of MAO was determined to be the result of flavonoids in the hypericin. Later studies could not confirm the MAOI effect (Muller et al, 1994). Other studies (Muller et al, 1998) reported an inhibition of the reuptake of norepinephrine and serotonin by *Hypericum* extract, which is the same mechanism of action as the tricyclics and selective serotonin reuptake inhibitors. Much of the antidepressant action may be attributed to hyperforin and adhyperforin (Chatterjee et al, 1998a, 1998b). These two constituents are found in the reproductive parts of the plant.

Antiretroviral/Antimicrobial Action

Investigation is underway into the possible antiretroviral action of St. John's wort and its use in the treatment of HIV infections (Chavez, 1997). Antiretroviral action may be due to protein kinase-C–mediated phosphorylation. However, in one study, significant cutaneous phototoxicity resulted during the study, with no antiretroviral action found in the 30 participants (Gulick et al, 1999). One study (Reichling et al, 2001) found *Hypericum perforatum* tea effective against methicillin-resistant strains of *S. aureus* with an MIC value of 1.0 mcg/ml.

Other Actions

One study (Mannucci et al, 2007) identified the serotonin-mediated beneficial effects of St. John's wort on reducing nicotine withdrawl symptoms. Another study identified the reduction of ceralein-induced acute pancreatitis in mice (Genovese et al, 2006).

Product Availability

Cream; sublingual capsules; solid forms: 100, 300, 500 (0.3% hypericin), 250 (0.14% hypericin) mg; tincture

Plant Part Used: Flowers

Dosages

- Adult PO: 300 mg hypericum extract, standardized to 0.3% hypericin, tid
- Adult topical: apply prn

Contraindications

Pregnancy category is 2; breastfeeding category is 3A.
St. John's wort should not be given to children. Persons who are hypersensitive to this herb should not use it.

Side Effects/Adverse Reactions

CNS: Dizziness, insomnia, restlessness, fatigue (PO)
GI: Constipation, abdominal cramps (PO)
INTEG: Photosensitivity, rash, hypersensitivity

Interactions

Drug

ACE inhibitors, hormonal contraceptives, loop diuretics, NSAIDs, sulfonamides, sulfonylureas, tetracyclines, thiazide diuretics: St. John's wort combined with these products may lead to severe photosensitivity; avoid concurrent use.
Alcohol, MAOIs: St. John's wort may increase MAO inhibition (suggested by early studies); do not use alcohol, MAOIs and St. John's wort concurrently until research is available.
Amphetamines, antidepressants, trazodone, tricyclics: St. John's wort used with these products may cause serotonin syndrome.
Antiretrovirals, nonnucleoside reverse transcriptase inhibitors (NNRTIs), protease inhibitors: Studies indicate that St. John's wort taken PO in combination with indinavir may decrease the antiretroviral action of this drug.
Cytodrome P450 1A2, 2C9, 3A4: St. John's wort induces these enzyme systems.
Immunosuppressants: Rejection of transplanted hearts has occurred when St. John's wort was taken PO with cyclosporine, an immunosuppressant. Other immunosuppressants may have the same drug interaction in heart transplants, as well as other transplants.
Paroxetine: Increased sedation may result when paroxetine is combined with St. John's wort (Gordon, 1998).
SSRIs: Serotonin syndrome and an additive effect may occur when SSRIs are combined with St. John's wort. Concurrent use may lead to coma. Do not use concurrently.

Interactions—cont'd

Food

Catecholamines, tyramine: Limit foods high in tyramine or catecholamines until further research confirms or denies the MAOI action of St. John's wort taken PO.

Lab Test

Growth hormone: St. John's wort may cause increased growth hormone (somatotropin, GH).

Digoxin, serum iron, serum prolactin, theophylline: St. John's wort may cause decreased serum prolactin, theophylline (aminophylline), serum iron, and digoxin (peak and trough concentrations).

Pharmacology

Pharmacokinetics

Very little is known about the pharmacokinetics in humans. St. John's wort is thought to cross the blood-brain and placental barriers and possibly enter breast milk.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Naphthodianthrone	Hypericin; Pseudohypericin	Antiinflammatory; antitumor; antiviral (Raffa, 1998; Yip et al, 1996)
	Hyperforin	Antidepressant
Phenol	Caffeic acid; Chlorogenic acid	Antiseptic; disinfectant
	P-Coumaric acids; Hyperforin	
Flavonoid	Hyperin; Hyperoside; Isoquercitrin; Kaempferol; Luteolin; Quercetin, Quercitrin, Rutin	
Bioflavonoid	Amenotoflavone; Biapigenin	Antiinflammatory; antiulcergenic
Phloroglucinol	Adhyperforin	Inhibits serotonin, dopamine, norepinephrine; antidepressant
Above ground parts also contain **Tannin**		Wound healing

Client Considerations

Assess

Antidepressant Use

- Assess the client's mental status: mood, sensorium, affect, memory (long, short), change in depression or anxiety levels.
- Assess for the use of MAOIs and SSRIs, which should not be used with St. John's wort (taken PO) until further research is available.
- Assess for other drugs, foods, and herbs the client uses on a regular basis (see Interactions).

Antiretroviral Use

- Assess for signs of infection.
- Assess CBC, blood chemistry, plasma HIV, RNA, absolute CD4/CD8^{+}/cell counts/%, serum b-2 microglobulin, and serum ICD^{+} 24 antigen levels.

Administer

- PO: use 2 tsp herb in 150 ml boiling water. Steep 15 minutes to create infusion.
- Topical: use oily hypericum preparations to treat inflammation or burns. Apply as needed.

Teach Client/Family

- Inform the client that pregnancy category is 2 and breastfeeding category is 3A.
- Caution the client not to give St. John's wort to children.
- Advise the client to avoid high-tyramine foods such as aged cheese, sour cream, beer, wine, pickled products, liver, raisins, bananas, figs, avocados, meat tenderizers, chocolate, and yogurt and to avoid increased caffeine intake when using this herb PO.
- Inform the client that the therapeutic effect may take 4 to 6 weeks for the treatment of depression. If no improvement occurs in that time, another therapy should be considered.
- Advise the client to avoid the use of alcohol or over-the-counter products that contain alcohol when using this herb PO.
- Advise the client to avoid the sun or use sunscreen or protective clothing to prevent photosensitivity when using this herb.

Storax

(stoe′raks)

Scientific name: *Liquidambar orientalis*

Other common names: Alligator tree, star-leaved gum, sweet gum tree, balsam styracis, liquid amber, opossum tree, red gum, white gum

Origin: Storax is a tree found in Turkey.

Uses

Traditionally, storax has been used in warm-mist vaporizers and as an expectorant. It is used as a diuretic and to treat diarrhea and sore throat. In addition, it is used in the furniture, cosmetic, and food industries. Externally, storax is used to treat wounds and ulcers.

Actions

Very little research is available to document any uses or actions of storax. Some researchers have proposed that storax may possess antimicrobial properties similar to those of tea tree (Wyllie et al, 1989). One study (Sadic et al, 2005) identified the antibacterial activity against many bacteria at concentrations of 10% and against some bacteria at concentrations of 1%, 0.4%, and 0.2%.

Product Availability

Crude balsam; no medicinal commercial preparations are available

Plant Parts Used: Bark, gum, leaves

Dosages

No dosage consensus exists.

Contraindications

Until more research is available, storax should not be used during pregnancy and breastfeeding. It should not be given to children. Persons with hypersensitivity to storax should not use it.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, diarrhea
INTEG: Hypersensitivity reactions, contact dermatitis

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Cinnamic acid **Phenylethylene** **Vanillin** **Aromatic alcohols** **Storesins** **Styrene** **Volatile oil** **Triterpenes**		

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of storax and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store storax in a cool, dry place, away from heat and moisture.
- Instruct the client to use storax externally on small areas only. External administration over large areas can lead to absorptive poisonings resulting in kidney damage.

Teach Client/Family

- Caution the client not to use storax in children or those who are pregnant or breastfeeding until more research is available.

Tea Tree Oil

Scientific name: *Melaleuca alternifolia*

Other common names: Australian tea tree oil, melaleuca oil, tea tree

Origin: Tea tree is found in Australia.

Uses

Tea tree oil traditionally has been used to clean superficial wounds and to treat insect bites and other skin conditions. All applications of this herb are topical.

Investigational Uses

Initial evidence is available documenting the use of tea tree oil for the treatment of bacterial, viral, and fungal infections; eczema; psoriasis; and acne vulgaris.

Actions

Antimicrobial Action

Tea tree oil has been tested for its antimicrobial properties. The essential oil shows broad-spectrum activity against *Escherichia coli, Staphylococcus aureus,* and *Candida albicans.* The antimicrobial activity of tea tree oil may result from its ability to disrupt the cell membrane (Cox et al, 2000). Another study (Hammer et al, 1998) demonstrated activity against *Candida* spp. Tea tree oil may also be useful for the treatment of yeast and fungal infections of the skin and mucosa. It has been shown to be effective against *C. albicans, Trichophyton rubrum, Trichophyton mentagrophytes, Trichophyton tonsurans, Aspergillus niger, Penicillium* sp., and *Microsporum gypsum* (Concha et al, 1998). *Pseudomonas aeruginosa* has been shown to be less susceptible than other species to the antimicrobial action of tea tree oil (Mann et al, 2000).

Other Actions

There may be antiinflammatory effects of tea tree oil as investigated on human peripheral blood leukocytes (Caldefie-Chézet et al, 2006).

Product Availability

Cream, lotion, ointment, soap (5%-100%); component in many other commercial products

Plant Parts Used: Branches, leaves

Dosages

- Adult topical: apply any available form prn (usually 70%-100% used for fungal infections, 5%-15% used for acne)

Contraindications

Until more research is available, tea tree oil should not be used during pregnancy and breastfeeding. Persons with hypersensitivity to the tea tree plant should not use tea tree oil.

Side Effects/Adverse Reactions

INTEG: Hypersensitivity reactions, contact dermatitis

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Coumarin	Dihydrocoumarin; Melilotic acid; Methyl melilotate; Ethyl melilotate; Coumaric acid (Ehlers et al, 1995)	Anticoagulant
Hydrocarbon	Terpinene Pinene; Cymene	Antimicrobial
Cineol		

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of tea tree oil and administer an antihistamine or other appropriate therapy.
- Assess the client's skin condition, including redness and pustules, if the client is using tea tree oil to treat skin disorders.

Administer

- Instruct the client to store tea tree oil in a sealed container away from heat and moisture.
- Instruct the client that tea tree oil is for external use only. It should not be taken internally.

Teach Client/Family

- Caution the client not to use tea tree oil during pregnancy and breastfeeding until more research is available.
- Advise the client that worsening skin conditions should be treated with more conventional therapy.

T

Thymus Extract

(thi′ mus eck′strakt)

Other common names: Pure thymic extract, thymomodulin, thymosin, thymus, thymus factor, thymus polypeptides

Origin: Bovine thymus gland

Uses

Thymus extract is used to treat infections (colds, flu, sinusitis), HIV/AIDS, rheumatoid arthritis, asthma, and cancer.

Actions

Thymus extract induces T-lymphocyte maturation with indirect effects on B cells and macrophages. It may improve immune function (Jellin et al, 2008). One study (Hammad et al, 2007) identified the antibacterial effect against *Streptococcus*

mutans by adhesion to buccal epithelial cells. This study used an aqueous extract of thymus.

Product Availability

Tablets, crude fraction, or polypeptides

Dosages

- Adult PO: 750 mg crude fraction or 120 mg pure polypeptides

Contraindications

Thymus extract should not be used in children or those who are pregnant or breastfeeding until more research is available.

Side Effects/Adverse Reactions

None reported. However contamination is a concern.

Interactions

Drug

Immunosuppressants: Thymus extract should not be used with immunosuppressants unless the extract is certified to be pathogen free (Jellin et al, 2008).

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Polypeptides		

Client Considerations

Assess

- Assess the reason the client is using thymus extract.
- Identify if the client is using immunosuppressants. If so, make sure that the thymus product that is being used is certified pathogen free.

Administer

- Instruct the client to keep thymus extract in a dry area, away from direct sunlight.

Teach Client/Family

- Teach the client that thymus extract should not be used in children or those who are pregnant or breastfeeding until more research is available.

Tonka Bean

(tawng′kuh been)

Scientific name: *Dipteryx odorata*

Other common names: Cumaru, tonka seed, tonquin bean, torquin bean

Origin: Tonka bean is a legume found in South America.

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Uses

Tonka bean is used to decrease nausea and vomiting. Traditionally used as an aphrodisiac, it is now considered by many to be an obsolete herb.

Investigational Uses

Initial research has begun on the use of tonka bean for the treatment of cancer and lymphedema.

Actions

Very few studies on tonka bean are available other than those done to determine its chemical components. The coumarins are known to produce an anticoagulant effect. One study evaluated the use of tonka bean in combination with gingko biloba and *Melilotus officinalis* to treat the functional symptoms of lymphedema. It was found that the use of these three herbs together provided significant improvement after the third month of treatment (Vettorello et al, 1996).

Product Availability

No commercially prepared forms are available.

Plant Parts Used: Fruit, seeds

Dosages

- Adult PO: 60 mg daily (coumarin content)

Contraindications

Class 3 herb (seed).

Tonka bean should not be used during pregnancy and breastfeeding. It should not be given to children. Persons with hypersensitivity to tonka bean should not use it. The FDA classifies tonka bean as unsafe.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, *hepatotoxicity*

INTEG: Hypersensitivity reactions

Interactions

Drug

Anticoagulants *(heparin, salicylates, warfarin)*, ***antiplatelets:*** Use of tonka bean with anticoagulants, antiplatelets may result in an increased risk of bleeding; avoid concurrent use.

Herb

Anticoagulant/antiplatelet herbs: Tonka bean with anticoagulant/antiplatelet herbs increases the risk of bleeding.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Coumarin	Coumaric acid; Dihydrocoumarin; Methyl melilotate; Ethyl melilotate; Melilotic acid	Anticoagulant, hepatotoxic

Continued

Primary Chemical Components and Possible Actions—cont'd

Chemical Class	Individual Component	Possible Action
Hydroxymethylfurfural		
Fat		
Isoflavones	Dimethoxyisoflavone (Januário et al, 2005)	

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of tonka bean and administer an antihistamine or other appropriate therapy.
- Assess for right upper-quadrant pain and assess hepatic function tests (AST, ALT, bilirubin) for increased levels. If results are elevated, discontinue the use of tonka bean.

Administer

- Instruct the client to store tonka bean in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use tonka bean in children or those who are pregnant or breastfeeding.
- Advise the client that the FDA classifies tonka bean as unsafe.

Turmeric

(tuhr′muh-rik)

Scientific name: *Curcuma longa*

Other common names: Curcuma, Indian saffron, Indian valerian, jiang huang, kyoo, radix, red valerian, tumeric, ukon

Origin: Turmeric is found in the Far East and tropical regions.

Uses

Turmeric traditionally has been used in both Chinese and Ayurvedic medicine to treat menstrual disorders, colic, inflammation, bruising, dyspepsia, hematuria, and flatulence. It is also used to improve stomach and liver function.

Investigational Uses

Research has begun to focus on the use of turmeric for the treatment of lung, gastrointestinal, oral, and breast cancers; viruses such as HIV/AIDS; cholecystitis; and joint pain associated with arthritis and other joint disorders.

Actions

A study (Ramsewak et al, 2000) demonstrated the anticancer and antioxidant actions of three chemical components of turmeric, curcumins I, II, and III, on leukemia, central nervous system disorders, renal cancer, breast cancer, colon

cancer, and melanoma. Turmeric is also known to inhibit tissue necrosis factor (TNF)-alpha. The chemical component diferuloylmethane has been shown to cause the most significant inhibition (Gupta et al, 1999). Turmeric may also exert hepatoprotective, antiinflammatory, antispasmodic, and hypolipidemic effects. One study (Uddin et al, 2005) identified the suppression of growth and induction of apoptosis in lymphoma. Another study (Ramaswami et al, 2004) used curcumin, one of the chemical components of turmeric, to identify the blocking of homocysteine-induced endothelial dysfunction. Turmeric may be useful in preventing cardiovascular disease.

Product Availability

Capsules, dried rhizome, fluid extract, oil, spice, tincture

Plant Part Used: Rhizome

Dosages

- Adult PO: 400-600 mg tid (standardized to curcumin content)
- Adult PO cut root: 1.5-3 g/day
- Adult PO fluid extract: 1.5-3 ml (1:1 dilution)
- Adult PO tincture: 10 ml (1:5 dilution)

Contraindications

Pregnancy category is 1; breastfeeding category is 2A.

Turmeric should not be used therapeutically by persons with bile duct obstruction, peptic ulcer, hyperacidity, gallstones, bleeding disorders, or hypersensitivity to this herb.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, *gastrointestinal ulceration (high doses)*

INTEG: Hypersensitivity reactions

Interactions

Drug

Anticoagulants *(heparin, salicylates, warfarin),* ***antiplatelets, NSAIDs*** *(bromfenac, diclofenac, etodolac, fenoprofen, flurbiprofen, ibuprofen, indomethacin, ketoprofen, ketorolac, meclofenamate, mefenamic acid, nabumetone, naproxen, oxaprozin, piroxicam, sulindac, tolmetin):* Use of turmeric with anticoagulants, antiplatelets, NSAIDs may result in an increased risk of bleeding; avoid concurrent use.

Immunosuppressants *(cyclosporine):* Turmeric may decrease the effectiveness of immunosuppressants; avoid concurrent use.

Herb

Anticoagulant/antiplatelet herbs: Turmeric with anticoagulant/antiplatelet herbs increases the risk of bleeding.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil	Curcumin I, II, III	Anticancer; antioxidant
	Sesquiterpenes	
Diferuloylmethane		Tissue necrosis factor (TNF)-alpha inhibition
Sugar	Polysaccharides	
Resin		
Vitamin	C	
Mineral	Potassium	
Carotene		

Client Considerations

Assess

- Assess for hypersensitivity reactions, including contact dermatitis. If present, discontinue the use of turmeric and administer an antihistamine or other appropriate therapy.
- Assess for the use of anticoagulants, NSAIDs, and immunosuppressants (see Interactions).
- Monitor coagulation studies if the client is using turmeric for long-term treatment.

Administer

- Instruct the client to store turmeric in a cool, dry place, away from heat and moisture.
- Instruct the client to take turmeric on an empty stomach.

Teach Client/Family

- Inform the client that pregnancy category is 1 and breastfeeding category is 2A.
- Advise the client to report bleeding gums, blood in the urine or stool, and bruising.

Valerian

(vuh-lir'ee-uhn)

Scientific name: *Valeriana officinalis*

Other common names: All heal, amantilla, baldrianwurzel, capon's tail, great wild valerian, herba benedicta, katzenwurzel, phu germanicum, phu parvum, setewale, setwell, theriacaria, valeriana

Origin: Valerian is a perennial that is now cultivated throughout the world.

Uses

Valerian is used to treat nervous disorders such as anxiety, restlessness, and insomnia.

Actions

Antianxiety Action

Valerian has been studied almost as extensively as St. John's wort. Its effects are primarily neurochemical, acting on gamma-aminobutyric acid A (GABA) receptors and possibly also with other presynaptic components (Ortiz et al, 1999). Other studies support this action (Cavadas et al, 1995; Sakamoto et al, 1992; Simmen et al, 1999).

Antiinsomnia Action

The largest study included 121 patients with severe insomnia (Vorbach et al, 1996). They saw significant improvement within 28 days. This may indicate valerian is most effective in long-term treatment.

Other Actions

Valerian has shown positive results in the treatment of angina, decreasing the frequency and shortening the duration of anginal attacks (Yang et al, 1994).

Product Availability

Capsules, crude herb, extract, tablets, tea, tincture; combination products containing other herbs

Plant Parts Used: Rhizomes, roots

Dosages

Insomnia

- Adult PO extract: 400-900 mg ½-1 hr before bedtime (standardized)
- Adult PO tea (crude herb): 1 tsp crude herb qid
- Adult PO tincture: 3-5 ml qid (standardized)

V

Contraindications

Pregnancy category is 2; breastfeeding category is 3A.

Caution should be used when giving valerian to children. Persons with hepatic disease and those with hypersensitivity to valerian should not use it.

Side Effects/Adverse Reactions

CNS: Insomnia, headache, restlessness
GI: Nausea, vomiting, anorexia, *hepatotoxicity (overdose)*
INTEG: Hypersensitivity reactions
MISC: Vision changes, palpitations

Continued

Interactions

Drug

***CNS depressants** (alcohol, barbiturates, benzodiazepines, opiates, sedatives/hypnotics):* Valerian may increase the effects of central nervous system depressants; avoid concurrent use.

Cytochrome P4503A4 substrates: Valerian may inhibit these enzyme systems.

Iron salts: Valerian may interfere with the absorption of iron salts; separate by 2 hours.

MAOIs, phenytoin, warfarin: Valerian may negate the therapeutic effects of MAOIs, warfarin, and products containing phenytoin; do not use concurrently.

Lab Test

ALT, AST, total bilirubin, urine bilirubin: Valerian may cause increased ALT, AST, total bilirubin, and urine bilirubin.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Volatile oil **Valepotriates** **Alkaloid** **Amino acid** **Flavonoid** **Phenol** **Fatty acid** **Aliphatic** **Resin** **Tannin**	Monoterpene; Sesquiterpene	Increase GABA

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of valerian and administer an antihistamine or other appropriate therapy.
- Assess liver function studies (AST, ALT, bilirubin) if the client is using valerian for long-term treatment. If results are elevated, discontinue use of the herb.
- Assess medications used (see Interactions).

Administer

- Instruct the client that valerian products should be kept away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 2 and breastfeeding category is 3A.
- Advise the client to use caution when giving valerian to children.
- Advise the client not to perform hazardous activities such as driving or operating heavy machinery until physical response to the herb can be evaluated. Valerian causes sedation and dizziness.
- Advise the client to discontinue the use of valerian if symptoms worsen.

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White Cohosh

(wite koe'hawsh)

Scientific name: *Actaea alba*

Other common names: Baneberry, snakeberry, coralberry, doll's eye

Origin: White cohosh is a perennial found on the west coast of North America and in the eastern region of the United States.

Uses

Traditionally, white cohosh has been used during childbirth and to treat menstrual disorders, much like black or blue cohosh. Several Native American tribes have used white cohosh to treat colds, cough, gastrointestinal disorders, and urinary tract disorders.

Actions

Very little information is available for white cohosh, and what information is available is mostly anecdotal. Although the entire white cohosh plant is toxic, the fruit and roots are the most toxic parts (Duke, 2002). Homeopaths have used this herb, but it not recommended for any use.

Product Availability

This herb is used by homeopaths. No commercial products are available.

Dosages

No published dosages are available.

Contraindications

White cohosh should never be used during pregnancy and breastfeeding. It should never be given to children. This is a toxic plant and should never be consumed, especially the fruit and roots. Because of its toxicity, white cohosh is not recommended for use except under the supervision of a qualified herbalist.

Side Effects/Adverse Reactions

CNS: Delirium
CV: *Tachycardia, circulatory failure*
GI: Nausea, vomiting, anorexia, severe abdominal cramps
INTEG: Hypersensitivity reactions

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Essential oil		
Protoanemonin		Severe irritant

Client Considerations

Assess

- Assess for symptoms of toxicity: delirium, severe abdominal cramping, headache, tachycardia, and circulatory collapse.

Administer

- Perform lavage or induce vomiting if the client has ingested this herb.

Teach Client/Family

- Warn the client never to use white cohosh in children or those who are pregnant or breastfeeding. Toxicity may result.
- Warn the client not to use white cohosh for any purpose. This plant is too toxic for any use.

Wild Cherry

Scientific names: *Prunus virginiana, Prunus serotina*

Other common names: Black cherry, black choke, choke cherry, rum cherry, Virginia prune

Origin: Wild cherry is found in the United States.

Uses

Traditionally, wild cherry has been used to treat hot, dry, percussive coughs; colds; respiratory symptoms; and diarrhea. It has also been used as an astringent and bronchial sedative. Wild cherry is typically combined with other supportive lung herbs in formula.

Investigational Uses

Research is underway to determine possible uses for wild cherry as a cancer treatment.

Actions

Almost no research exists regarding the actions or uses of wild cherry. The available studies have tended to focus on its toxic effects. Because cyanide is present in the bark, seeds, and leaves, wild cherry should be used only under the direction of a qualified herbalist. If used properly, and for a few days only, this herb is considered safe. Wild cherry prepared as a cold infusion has a much lower cyanide content than when prepared as a decoction.

Product Availability

Fluid extract, syrup, tea, tincture

Plant Part Used: Bark

Dosages

- Adult PO syrup: 1-2 g in 8 oz boiling water, tid (whole syrup recipe)
- Adult PO tea: 3 tsp dry bark in 8 oz cold water, let stand 8 hr, strain
- Adult PO tincture: 1-5 ml qid (1:5 dilution) (Moore, 1995)

Contraindications

Pregnancy category is 4; breastfeeding category is 2A.

Wild cherry should not be given to children. Persons with respiratory or cardiovascular depression or hypotension should not use this herb (Moore, 1995).

Side Effects/Adverse Reactions

CNS: Headache, tremors, stupor, *coma, death*
GI: Nausea, vomiting, anorexia, constipation, ulcer
MS: Muscle weakness
RESP: *Respiratory failure*

Interactions

Drug

Cytochrome P4503A4 enzyme substrate agents *(astemizole, azole antifungals, benzodiazepines, buspirone, calcium channel blockers, cyclosporine, estrogens, statins):* Use with wild cherry may slow the metabolism; avoid concurrent use.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Cyanogenic glycoside	Amygdalin	Poison
	Prunasin	
Acid	Phytosterol; Emulsin; Oleic acid; *P*-Coumaric acid; Trimethyl gallic acid	
Ipuranol		
Dextrose		
Tannin		Wound healing; antiinflammatory
Starch		
Calcium oxalate		

Client Considerations

Assess

- Assess for changes in respiration (decreased or labored breathing, shortness of breath). If these symptoms are present, discontinue the use of wild cherry.

Administer

- Instruct the client to store wild cherry in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 4 and breastfeeding category is 2A.
- Warn the client that overdose can be fatal as a result of cyanide poisoning. If poisoning does occur, an antidote of thiosulfate or ethylenediaminetetraacetic acid (EDTA) may be necessary.
- Caution the client not to give wild cherry to children and to store all wild cherry products in a locked cabinet, out of the reach of children.
- Inform the client that no proven uses or actions exist for this herb and that other herbs or medications are safer options.

Wild Yam

Scientific name: *Dioscorea villosa* L.

Other common names: Colic root, Mexican wild yam, rheumatism root

Origin: Wild yam is a vine found in the United States and Central America.

Uses

Wild yam is used to treat gallbladder disease, dysmenorrhea, menopausal symptoms, rheumatic conditions, and cramps.

Actions

Hormone Supplementation/Menopausal Symptoms

DHEA is synthesized from a precursor steroid, pregnenolone, then converted into estrogens and testosterone in both men and women (Baulieu, 1996). Levels of DHEA are reported to decline significantly after age 40; however, supplementation should not be started before a thorough evaluation of hormone-sensitive tumors is performed. Some researchers suspect that the decline in DHEA may be associated with insulin resistance, increased weight gain, and cardiovascular conditions (Sahelian, 1997). DHEA supplementation may be an alternative to hormone replacement therapy in women. Wild yam had little effect on menopausal symptoms when 23 symptomatic women used wild yam cream for 4 weeks (Komesaroff et al, 2001).

Cancer Stimulant/Cancer Inhibitor

Conflicting studies have reported increased tumor flare of prostate cancer in patients. However, in one study, when antihormone therapy was initiated, the flare retreated (Jones et al, 1997).

Cardiovascular Action

One study evaluated DHEA levels in patients with congestive heart failure. The results showed that levels of DHEA are lower in patients with congestive heart failure in proportion to the severity of disease (Moriyama et al, 2000).

Immunoregulator Action

One study using laboratory mice (Cheng et al, 2000) evaluated the effects of DHEA and DHEA sulfate on interleukin-10 (IL-10). The results indicated an increase in interleukin-10 (IL-10) and that DHEA may be able to affect the functioning of B-lymphocytes.

Cognitive Function Enhancer

DHEA levels have been found to be significantly lower in persons with Alzheimer's disease and vascular dementia than in the general population, whereas the opposite is true for cortisol levels. The applicability of this information in the treatment of clients with cognitive function impairment is unknown at this time (Bernardi et al, 2000).

Product Availability

Fluid extract, oil, powder, tea, tincture; also available as DHEA (see pages 230–232)

Plant Part Used: Rhizome

Dosages

NOTE: See also dosages for DHEA on page 231.

- Adult PO fluid extract: 2-4 ml (5-30 drops) tid
- Adult PO tincture: 2-10 ml tid (1:5 dilution in 45% alcohol)
- Adult topical oil: may be applied to affected area prn

Contraindications

Class 1 herb (rhizome).

Until more research is available, wild yam should not be used during pregnancy and breastfeeding. It should not be given to children. This herb should not be used by persons with hepatic disease or by those with a family history of breast, uterine, ovarian, or prostate cancer. Persons with hypersensitivity to wild yam should not use it.

Side Effects/Adverse Reactions

CNS: Headache

GI: Nausea, vomiting, anorexia

GU: Menstrual changes, *possibility of stimulating hormone-related cancers*

INTEG: Hypersensitivity reactions, acne, alopecia, hirsutism, oily skin

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Steroidal saponin	Dioscin; Diosgenin; Dioscenin; Dioscin, Methyl Parvifloside, Zingiberensis, Dltonin Methyl Protodeltonin (Hayes et al, 2007)	
Sterol	Beta-sitosterol	
Alkaloid		
Tannin		Antiinflammatory
DHEA		Steroid

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of wild yam and administer an antihistamine or other appropriate therapy.
- Assess the client's family history of hormone-induced cancers (breast, ovarian, uterine, prostatic). If these are present, the client should avoid the use of wild yam.

Administer

- Instruct the client to store wild yam products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use wild yam in children or those who are pregnant or breastfeeding until more research is available.
- Advise the client that high doses of wild yam (>25 mg DHEA/day) may cause irreversible voice change and hirsutism.

Wintergreen

(win′tuhr-green)

Scientific name: *Gaultheria procumbens*

Other common names: Boxberry, Canada tea, checkerberry, deerberry, gaultheria oil, mountain tea, oil of wintergreen, partridgeberry, teaberry

Origin: Wintergreen is a shrub found in North America.

Uses

Traditionally, wintergreen has been used topically to treat sore, inflamed muscles and joints, often after exercise. It may also be useful in the treatment of neuralgia. Wintergreen is used internally to treat bladder inflammation and urinary tract diseases, as well as diseases of the prostate and kidney.

Actions

As is the case with other salicylates, the chemical component methylsalicylate is responsible for the antiinflammatory and anticoagulant properties of wintergreen. It is reported to act as a counterirritant. Oral ingestion stimulates gastric function.

Product Availability

Cream, lotion, lozenges, oil, ointment, tea

Plant Parts Used: Bark, leaves

Dosages

- Adult topical cream/ointment: apply to affected area tid-qid prn (10%-30% strength)

Contraindications

Class 1 herb (leaf).

Until more research is available, wintergreen should not be used during pregnancy and breastfeeding. It should not be given to children. Wintergreen should not be used internally by persons with gastroesophageal reflux disease. Persons with hypersensitivity to wintergreen should not use it. Because of its hydroquinone glycoside content, this herb is not recommended for long-term use.

Side Effects/Adverse Reactions

Internal Use

GI: Nausea, vomiting, anorexia, gastrointestinal irritation

INTEG: Hypersensitivity reactions

MISC: Hyperpnea, lethargy

Internal or Topical Use

SYST: *Salicylate toxicity—tinnitus, nausea and vomiting, electrolyte imbalances, central nervous system toxicity, bleeding, hepatitis, endocrine changes, rhabdomyolysis, death*

Interactions

Drug

Anticoagulants *(heparin, warfarin)* ***salicylates:*** Use of wintergreen with anticoagulants, salicylates may cause an increased risk of bleeding; avoid concurrent use.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Salicylate	Methylsalicylate	Antiinflammatory; anticoagulant
Gaultherin		
Carbohydrate		
Tannin		
Hydroquinone derivative	Isohomoarbutin; Arbutin	

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of wintergreen and administer an antihistamine or other appropriate therapy. Clients who are hypersensitive to salicylates should not use this product.
- Assess for symptoms of salicylate toxicity (tinnitus, nausea, vomiting) if the client is using high doses of wintergreen over a prolonged period.
- Assess for the use of anticoagulants (see Interactions). Monitor coagulation studies if the client is taking wintergreen internally.

Administer

- Instruct the client to store wintergreen products in a sealed container away from heat and moisture.

Teach Client/Family

- Caution the client not to use wintergreen during pregnancy and breastfeeding until more research is available.
- Caution the client not to give wintergreen to children. Deaths have been reported. If viral symptoms are present in children, Reye's syndrome may occur if wintergreen is used.
- If the client is using wintergreen topically, advise the client to leave the affected area open to air or to wrap only in material with no heating capability.
- Caution the client not to use wintergreen oil internally.
- Advise the client to avoid use of topical wintergreen products during hot or humid weather.

Witch Hazel

(wich hayz'uhl)

Scientific name: *Hamamelis virginiana*

Other common names: Snapping hazel, spotted alder, tobacco wood, winterbloom

Origin: Witch hazel is a bush found in North America.

Uses

Traditionally, witch hazel has been used to relieve hemorrhoidal, vaginal, and anal itching; decrease inflammation; and promote the healing of bruises, varicose veins, and other local inflammation. It is also used as a gargle to decrease oral irritation and inflammation and may be used as a tea for diarrhea.

Actions

Witch hazel has been evaluated for its antiinflammatory, antiviral, and antiaging actions.

Antiinflammatory Action

One study evaluated the antiinflammatory action of *Polygonum bistorta, Guaiacum officinale,* and *Hamamelis virginiana* in rats. Witch hazel did not act as an antiinflammatory in the acute stages of inflammation but did show antiinflammatory properties in the chronic phase (Duwiejua et al, 1994). Another study documented the antiinflammatory properties of witch hazel when used as an after-sun lotion (Hughes-Formella et al, 1998).

Antiviral Action

The antiviral action of witch hazel was shown against herpes simplex virus type 1 (HSV-1). Its antioxidative qualities were demonstrated by its radical-scavenging ability (Erdelmeier et al, 1996).

Antiaging Action

The active-oxygen scavenging action of witch hazel has been documented. This action may help to delay aging of the skin (Masaki et al, 1995).

Product Availability

Cream, dried leaves, fluid extract, pads, rectal suppositories, vaginal suppositories, witch hazel water

Plant Parts Used: Bark, leaves

Dosages

- Adult PO dried leaf gargle: 2 g tid
- Adult PO fluid extract: 2-4 ml tid (1:1 dilution in 45% alcohol)
- Adult topical witch hazel water: apply to affected area tid-qid prn

Contraindications

Class 1 herb (bark, leaf).

Until more research is available, witch hazel should not be used during pregnancy and breastfeeding. Persons who are hypersensitive to witch hazel should not use it. Witch hazel should not be ingested.

Side Effects/Adverse Reactions

GI: Nausea, vomiting, anorexia, constipation, *hepatotoxicity*
INTEG: Hypersensitivity reactions, contact dermatitis

Interactions

Drug

Iron salts: Witch hazel leaf, bark tea may decrease the absorption of iron salts; separate by 2 hours.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Flavonoid	Quercetin; Kaempferol	
Volatile oil	Eugenol; Safrole	
Saponin		
Tannin	Hamamelitannin	Tumor necrosis factor inhibition (Habtemariam, 2002)
Calcium oxalate		
Resin		
Gallic acid		

Client Considerations

Assess

- Assess for hypersensitivity reactions, including contact dermatitis. If present, discontinue the use of witch hazel and administer an antihistamine or other appropriate therapy.
- Assess for right upper-quadrant pain. Assess hepatic function tests (AST, ALT, bilirubin). If results are elevated, discontinue the use of witch hazel.

Administer

- Advise the client to use witch hazel topically or as gargle only; it should not be taken internally.
- Instruct the client to store witch hazel products in a sealed container away from heat and moisture.

Teach Client/Family

- Caution the client not to use witch hazel during pregnancy and breastfeeding until more research is available.

Wormseed

(werm′ seed)

Scientific name: *Artemisia absinthium, Artemisia princeps*

Other common names: Levant wormseed, santonica, sea wormwood, semen cinae, semen sanctum

W

Origin: Wormseed is found throughout Asia.

Uses

Traditionally, wormseed is used as an anthelmintic for children and adults.

Actions

Most of the information on the action and uses for wormseed come from anecdotal reports. One study (Omer et al, 2007) identified the steroid-sparing effect of wormwood when used in Crohn's disease. The mood and quality of life was also increased. Further research is lacking.

Product Availability

Tablets, powder, dried herb, lozenges

Plant Parts Used: Flowers, seeds

Dosages

- Adult PO: 2-4 grains

Contraindications

Wormseed should not be used in children or those who are pregnant, breastfeeding, or hypersensitive to this herb.

Side Effects/Adverse Reactions

CNS: *Seizures*, headache
EENT: Blurred vision
GI: Anorexia, nausea, vomiting
INTEG: Rash

Interactions

Drug

Anticonvulsants: Wormseed may lower the seizure threshold; do not use concurrently.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Glycoside **Volatile oil**	Santonin	Anthelmintic

Client Considerations

Assess

- Assess the reason the client is using wormseed.

Administer

- Instruct the client to keep wormseed in a cool, dry area, away from excessive light.

Teach Client/Family

- Teach the client that wormseed should not be used in children or those who are pregnant or breastfeeding until more research is available.

Yarrow

(ya-row)

Scientific name: *Achillea millefolium*

Other common names: Bloodwort, gordaldo, milfoil, nosebleed, old man's pepper, sanguinary, soldier's woundwort, stanchgrass, thousand-leaf

Origin: Yarrow is found in Asia, Europe, and North America.

Uses

Yarrow is used internally to treat respiratory, gastrointestinal, urinary tract, and reproductive conditions. It is used topically to promote wound healing and to treat eczema and other skin disorders.

Actions

Several actions have been proposed for yarrow, including contraceptive, antitumor, and antiplaque actions.

Contraceptive Action

One study showed that antispermatogenesis occurred in mice when an extract of yarrow was given at 200 mg/kg/day intraperitoneally for 20 days (Montanari et al, 1998).

Antitumor Action

One group of researchers who were observing cell division noted that an increase in tumor growth occurred during metaphase that may be due to the cytotoxic effects of yarrow (Montanari et al, 1998). Another study evaluated the antitumor properties of yarrow (Tozyo et al, 1994). The sesquiterpenoids were found to be active against leukemia in the mouse.

Antiplaque Action

One study proposed that the use of yarrow slows plaque formation and the development of gingivitis; however, no changes were noted in the control group (Van der Weijden et al, 1998).

Other Actions

Actions that are hepatoprotective, antispasmodic, and calcium antagonistic were identified (Yaeesh et al, 2006). When the extract was used in laboratory animals with induced hepatitis, the mortality rate decreased to 40% from 100% of those untreated.

Product Availability

Capsules, fluid extract, powder, tea, tincture

Plant Parts Used: Dried leaves, flowering tops

Dosages

- Adult PO fluid extract: 1-2 ml tid (1:1 dilution in 25% alcohol)
- Adult PO tea: 2-4 g tid
- Adult PO tincture: 2-4 ml tid (1:5 dilution in 45% alcohol)
- Adult topical sitz bath: 100 g herb/5 gal hot water, soak 10-20 min, rinse

Contraindications

Pregnancy category is 4; breastfeeding category is 3A.

Yarrow should not be used by persons with hypersensitivity to this plant or other members of the Compositae family, such as *Chamomilla recutita, Tanacetum parthenium,* or *Tanacetum vulgare.*

Side Effects/Adverse Reactions

CNS: Drowsiness, sedation
GI: Nausea, vomiting, anorexia
GU: Uterine stimulation
INTEG: Hypersensitivity reactions, contact dermatitis, photosensitivity

Interactions

Drug

Antacids, H_2-blockers, proton pump inhibitors: Yarrow may decrease the action of these agents (Jellin et al, 2008).
Anticoagulants *(heparin, warfarin)*, ***antiplatelets, salicylates:*** Use of yarrow with anticoagulants, antiplatelets, salicylates may result in an increased risk of bleeding; do not use concurrently.
Antihypertensives: Use of yarrow with antihypertensives may result in increased hypotension; do not use concurrently.
CNS depressants *(sedatives/hypnotics, alcohol, opiates, barbiturates):* Use of yarrow with central nervous system depressants may cause increased sedation; avoid concurrent use.
Iron salts: Yarrow tea may decrease the absorption of iron salts; separate by 2 hours.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Tannin		Astringent; wound healing
Fatty acid	Linoleic acid; Palmitic acid; Oleic acid	
Amino acid	Alanine; Histidine; Leucine; Lysine	
Sesquiterpene Peroxide	Achimillic acids A, B, C	Antitumor
Volatile oil	Linalool; Borneol; Camphor; Cineole	

Client Considerations

Assess

- Assess for hypersensitivity reactions, including contact dermatitis. If present, discontinue the use of yarrow and administer an antihistamine or other appropriate therapy.
- Determine whether the client is taking anticoagulants, antihypertensives, or CNS depressants (see Interactions).

Administer

- Instruct the client to store yarrow products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Inform the client that pregnancy category is 4 and breastfeeding category is 3A.
- Advise the client who is allergic to other plants of the Compositae herb family not to use yarrow.
- Inform the client to monitor for bleeding and bruising and to discontinue use of yarrow if these are present.
- Advise the client not to perform hazardous activities such as driving or operating heavy machinery until physical response to the herb can be evaluated.
- Advise the client to use sunscreen and wear protective clothing, or to stay out of the sun, while using yarrow. Yarrow may cause photosensitivity.

Yellow Dock

(yeh-low dahk)

Scientific name: *Rumex crispus*

Other common names: Chin ch'iao mai, curled dock, curly dock, garden patience, hualtata, hummaidh, kivircik labada, narrow dock, niu she t'ou, oseille marron, sour dock, surale di bierdji

Origin: Yellow dock is a weed found in the United States, Europe, and Asia.

Uses

Yellow dock is used primarily as a laxative or astringent. Topically, it may be used as an antidote to stinging nettle and to treat scabies and psoriasis. Traditionally, it has been used internally as a blood cleanser and to treat sore throat and fever.

Actions

Most of the available research on yellow dock focuses on its toxicology. One study investigated acute oxalate poisoning in sheep that had ingested *Rumex crispus.* Symptoms of toxic reactions included tremors, ataxia, and increased salivation (Panciera et al, 1990). Another study focused on the fatal poisoning of a 53-year-old man who died 72 hours after simply ingesting *Rumex crispus* (Reig et al, 1990). One study (Kim et al, 2004) identified the antifungal action of *Rumex crispus*. This extract was found to be more active than polyoxin B.

Product Availability

Capsules (ground root), extract, tea

Plant Parts Used: Root (dried and fresh), rhizome

Dosages

- Adult PO: 2.5-5 mg daily

Contraindications

Pregnancy category is 3; breastfeeding category is 3A.

Yellow dock should not be given to children. Persons with renal/hepatic disease, electrolyte imbalances, or hypersensitivity to this herb should not use yellow dock.

Continued

Contraindications—cont'd

Persons with diabetes mellitus, poor nutritional status, or dehydration should use it with caution.

Side Effects/Adverse Reactions

ENDO: *Severe electrolyte imbalances (hypocalcemia, metabolic acidosis)*
GI: Nausea, vomiting, anorexia, cramps, diarrhea
INTEG: Hypersensitivity reactions

Interactions

Drug

Calcitonin, diuretics, mithramycin, phenytoin: Yellow dock may cause increased hypocalcemia when used with calcitonin, diuretics, mithramycin, and phenytoin; do not use concurrently (theoretical).
Calcium, iron, zinc: Yellow dock tea may decrease the absorption of these minerals; separate by 2 hours.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Chrysophanic acid		
Rumicin		
Calcium oxalate		
Tannin		Astringent
Flavonoid	Quercetin	Antiinflammatory
Anthracene	Emodin	Laxative
	Chrysophanol; Aloe-emodin; Rhein	
Naphthalene	Lapodin; Neopodin	

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of yellow dock and administer an antihistamine or other appropriate therapy.
- Determine whether the client is taking prescription drugs or other herbal products. Yellow dock should not be used with diuretics, phenytoin, mithramycin, or calcitonin (see Interactions).

Administer

- Instruct the client to store yellow dock products away from moisture and light.

Teach Client/Family

- Inform the client that pregnancy category is 3 and breastfeeding category is 3A.
- Caution the client not to give yellow dock to children.

Yellow Lady's Slipper

(yeh'low lay'deez sli-puhr)

Scientific names: *Cypripedium pubescens, Cypripedium calceolus*

Other common names: American valerian, moccasin flower, nerveroot, Noah's ark, whippoorwill's shoe, yellow Indian shoe

Origin: Yellow lady's slipper is an orchid found in the forests of Europe and the United States. It is considered an endangered species.

Uses

Yellow lady's slipper traditionally has been used as a sedative and a treatment for anxiety and insomnia. It has also been used as an antispasmodic, an antidepressant, and to prevent seizures.

Actions

No research studies support any actions of or uses for yellow lady's slipper. Therefore this herb is not recommended for any use.

Product Availability

Extract, powdered root, rhizome, tea, tincture; component of various combination products

Plant Parts Used: Rhizome, roots

Dosages

No consensus on dosage exists. Because it is on the endangered species list, yellow lady's slipper is not recommended for use.

Contraindications

Until more research is available, yellow lady's slipper should not be used during pregnancy and breastfeeding. It should not be given to children. Persons with psychosis, severe anxiety reactions, severe depression, migraines, cluster headaches, or hypersensitivity to this herb should not use it.

Side Effects/Adverse Reactions

CNS: Headache, insomnia, restlessness, stimulation
GI: Nausea, vomiting, anorexia
INTEG: Hypersensitivity reactions, contact dermatitis

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Resinoid	Cypripedin	
Glycoside		
Quinone	Cypripedi	
Acid	Tannic acid; Gallic acid	

Client Considerations

Assess

- Assess for hypersensitivity reactions and contact dermatitis. If present, discontinue the use of yellow lady's slipper and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store yellow lady's slipper products in a cool, dry place, away from heat and moisture.
- Inform the client that this herb is on the endangered species list and is illegal to collect.

Teach Client/Family

- Caution the client not to use this herb in children or those who are pregnant or breastfeeding until more research is available.

Yerba Maté

(yehr'buh mah-tay')

Scientific name: *Ilex paraguariensis*

Other common names: Armino, Bartholomew's tea, boca juniors, campeche, el agricultor, elacy, flor de lis, gaucho, jaguar, Jesuit's tea, la hoja, la mulata, la tranquera, lonjazo, madrugada, maté, nobleza gaucha, oro verde, Paraguay tea, payadito, rosamonte, safira, union, yi-yi, zerboni

Origin: Yerba maté is an evergreen found in South America.

Uses

Yerba maté is used as a diuretic and to treat depression, lethargy, fatigue, constipation, arthritis, diabetes, gastrointestinal disorders, urinary tract infections, cardiac insufficiency, arrhythmias, and kidney or bladder stones. In China, it is used parenterally as an antihypertensive.

Actions

Primary research has focused on several actions of yerba maté, including vasodilation, antioxidant, and antiobesity actions.

Vasodilation Action

One study evaluated the vasodilatory effects of *Ilex paraguariensis* leaves in rats. Researchers documented a vasorelaxing effect (Muccillo Baisch et al, 1998).

Antioxidant Action

Two studies reported the antioxidant effects of yerba maté. One study (Schinella et al, 2000) showed the antioxidant effect against free radicals. The second study identified the antioxidant effect as comparable to that of ascorbic acid (vitamin C).

Antiobesity Action

One study investigated the usefulness of yerba maté in the reduction of obesity. However, results indicated no effect (Martinet et al, 1999).

Other Actions

One study (Milioli et al, 2007) found yerba maté to be effective for use in Parkinson's disease in animal models.

Product Availability

Fluid extract, leaves, tea

Plant Part Used: Dried leaves

Dosages

- Adult PO fluid extract: 2-4 ml tid (1:1 dilution in 25% alcohol)
- Adult PO tea: 2-4 g tid

Contraindications

Class 2d herb (leaf).

Until more research is available, yerba maté should not be used during pregnancy and breastfeeding. It should not be given to children. Persons with anxiety disorders, hypertension, or hypersensitivity to this herb should not use it.

Side Effects/Adverse Reactions

CNS: Anxiety, nervousness, insomnia, restlessness, irritability, headache
GI: Nausea, vomiting, anorexia, *hepatotoxicity*
INTEG: Hypersensitivity reactions
SYST: *Carcinogenic (long-term use)*

Interactions

Drug

Antidiabetics: Yerba maté may decrease the action of antidiabetics.
CNS depressants *(alcohol, sedatives/hypnotics, opiates, barbiturates, benzodiazepines):* Use of central nervous system depressants with yerba maté may produce an antagonistic effect; avoid concurrent use.
CNS stimulants: Yerba maté may increase the effects of central nervous system stimulants; use together cautiously.
Diuretics: Yerba maté may increase the effects of diuretics; avoid concurrent use.
MAOIs: Yerba maté with MAOIs may lead to hypertensive crisis (theoretical).

Food

Caffeine-containing products: Caffeinated foods and drinks may increase the effects of yerba maté; avoid concurrent use.

Pharmacology

Pharmacokinetics

Yerba maté stimulates the central nervous system; possesses diuretic, analeptic, positive inotropic, and chronotropic effects; and is lipolytic and glycogenolytic.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Methylxanthine	Caffeine; Theobromine; Theophylline	Central nervous system stimulant
Sterol		
Fat		
Ursolic acid		Antitumor
Mineral	Iron; Calcium; Manganese; Magnesium; Sodium; Potassium; Zinc; Copper	
Flavonoid	Rutin; Isoquercitrin; Kaempferol glycosides	

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of yerba maté and administer an antihistamine or other appropriate therapy.
- Assess for the use of CNS stimulants, CNS depressants, diuretics, and products that contain caffeine (see Interactions).
- Assess for right upper-quadrant pain. Assess hepatic function tests (AST, ALT, bilirubin). If results are elevated, discontinue use of yerba maté.

Administer

- Instruct the client to store yerba maté products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use yerba maté in children or those who are pregnant or breastfeeding until more research is available.
- Advise the client not to use yerba maté if he or she is allergic to other plants in the Aquifoliaceae family (e.g., holly).
- Inform the client that using large amounts of yerba maté for a long period can lead to cancers of the gastrointestinal and urinary tracts.

Yerba Santa

(yehr′buh sahn′tuh)

Scientific name: *Eriodictyon californicum*

Other common names: Bear's weed, consumptive's weed, eriodictyon, gum bush, gum plant, holly herb, holy weed, mountain balm, sacred herb, tarweed

Origin: Yerba santa is an evergreen found in the southwestern region of the United States.

Uses

Yerba santa traditionally has been used by Native Americans to decrease bruise and muscle inflammation. It has also been used to treat colds, asthma, congestion, allergies, arthritis, and rheumatism. The leaves are smoked or chewed to treat asthma.

Actions

Very little primary research is available for yerba santa. The only study found identified 12 new flavonoids that inhibited the metabolism of a carcinogen in hamster embryos. The chemical components cirsimaritan and chrysoeriol are thought to be chemoprotective (Liu et al, 1992).

Product Availability

Dried leaves, fluid extract, liniment, powder, syrup, tea

Plant Parts Used: Dried leaves, roots

Dosages

- Adult PO expectorant: dried powdered leaves
- Adult PO tea: place dried leaves in water, boil, strain, drink prn
- Adult topical liniment: apply liniment of leaves to affected area prn
- Adult topical poultice: mix fresh leaves with water and apply to affected area prn

Contraindications

Class 1 herb (whole herb).

Until more research is available, yerba santa should not be used during pregnancy and breastfeeding. Persons with hypersensitivity to yerba santa should not use it.

Side Effects/Adverse Reactions

INTEG: Hypersensitivity reactions

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Flavonoid	Eriodictyol; Homoeriodictyol; Dimethoxyflavanone; Naringenin; Chrysoeriodictyol; Xanthoeriodictyol; Eriodict	
Flavone	Cirsimaritin; Chrysoeriol Hispidulin; Chrysin	Chemoprotective
Tannin		
Volatile oil		
Acid	Formic acid; Butyric acid; Cerotinic acid	
Resin	Pentacontane; Priodonal; Xanthoeriodictytol	
Phenol		

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of yerba santa and administer an antihistamine or other appropriate therapy.

Administer

- Instruct the client to store yerba santa products in a cool, dry place, away from heat and moisture.

Teach Client/Family

- Caution the client not to use yerba santa during pregnancy or breastfeeding until more research is available.

Yew

(yew)

Scientific names: *Taxus brevifolia, Taxus baccata*

Other common names: American yew, California yew, chinwood, globeberry, ground hemlock, Oregon yew, western yew

Origin: Yew is found in Canada and the Pacific Northwest region of the United States.

Uses

Yew is well known today as the plant used to manufacture the drug paclitaxel (Taxol), which is used to treat metastatic ovarian or breast cancer. Native Americans have used yew to treat arthritis and other joint disorders, as well as fever. As a folk medicine, the cooked yew leaves were used as an abortifacient; to promote menstruation; and to treat diphtheria, epilepsy, tapeworms, and tonsillitis.

Actions

Antineoplastic Action

Yew is known for its antineoplastic properties. The main chemical component responsible for these effects is taxol, from which the drug paclitaxel (Taxol) is derived. This drug currently is used to inhibit metastatic breast cancer. It does so by inhibiting reorganization of the microtubule network needed for interphase in the cell division cycle and for mitotic cellular functions; it also causes abnormalities in bundles of microtubules during the cell cycle and multiple esters of microtubules during mitosis. Research has documented the efficacy of using Taxol in combination with radiation to treat head and neck cancers, cervical carcinomas, and breast adenocarcinomas (Pradier et al, 1999). Another study evaluated the needles of different yew species for the presence of paclitaxel and related taxoids (Van Rozendaal et al, 2000). There appears to be a wide variation in taxane content in the different species found in different countries.

Product Availability

Capsules, extract, salve

Plant Parts Used: Bark, branch tips

Dosages

- Adult PO extract: 10-60 drops bid-qid
- Adult PO tea: 8 oz daily
- Adult topical salve: apply to affected area prn

= Pregnancy = Pediatric = Alert = Popular Herb

Contraindications

Until more research is available, yew should not be used during pregnancy and breastfeeding. It should not be given to children. Yew should not be used by persons who have hepatic disease or who are immunocompromised. Persons with hypersensitivity to yew should not use it. Yew is highly toxic and should be used only under the supervision of a skilled herbalist.

Side Effects/Adverse Reactions

CV: Hypotension, arrhythmias, elevated triglycerides and cholesterol
GI: Nausea, vomiting, anorexia, *hepatotoxicity*
HEMA: *Thrombocytopenia, leukopenia, anemia, neutropenia*
INTEG: Hypersensitivity reactions, alopecia
MS: Joint and muscle pain

Interactions

Drug

Antineoplastics: Use of yew with antineoplastics may cause increased myelosuppression; avoid concurrent use.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid	Taxol Taxine A, B; Taxicatin; Milossine; Ephedrine	Antineoplastic
Tannin		
Resin		
Lignan		
Flavonoid	Flavone; Sequoia; Ginkgetin; Sciadopytisin	

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of yew and administer an antihistamine or other appropriate therapy.
- Monitor hepatic function tests (AST, ALT, bilirubin). If results are elevated, the client may need to discontinue using yew.
- Assess for the use of antineoplastics (see Interactions).

Administer

- Instruct the client to store yew products away from heat, light, and moisture.

Teach Client/Family

- Caution the client not to use yew in children or those who are pregnant or breastfeeding until more research is available.
- Warn the client to use yew only under the supervision of a qualified herbalist. This herb is highly toxic.

Yohimbe

(yoh-heem'buh)

Scientific name: *Pausinystalia yohimbe*

Other common names: Aphrodien, corynine, johimbe, quebrachine, yohimbehe, yohimbene, yohimbime, yohimbine

Origin: Yohimbe is found in West Africa.

Uses

Yohimbe traditionally has been used in Africa as an aphrodisiac. It is also used as a hallucinogenic.

Investigational Uses

Yohimbe is being studied for its use as a treatment for male erectile dysfunction, diabetes, orthostatic hypotension, and clonidine overdose.

Actions

Chemically, yohimbe is similar in structure to reserpine and lysergic acid. One study found that commercial yohimbe products contain primarily the chemical component yohimbine and are devoid of other alkaloids. The high content of this component may increase the potential for toxicity (Al-Majed et al, 2006; Betz et al, 1995).

Erectile Dysfunction

One study evaluated the well-known use of yohimbe for the treatment of erectile disorders (Riley, 1994). It showed a slight benefit in erectile disorder as compared with controls. However, yohimbe interacts with several drugs, which may lead to problems when taking this herb (see Interactions). One of the main actions of yohimbe is alpha-2 antagonism.

Product Availability

Tablets

Plant Part Used: Bark

Dosages

Male Erectile Dysfunction

- Adult PO tablets: 5.4 mg tid; dose may be adjusted to user's response

Orthostatic Hypotension

- Adult PO tablets: 12.5 mg daily

Contraindications

Class 2d herb (bark).

Until more research is available, yohimbe should not be used during pregnancy and breastfeeding. It should not be given to children. Persons with renal/hepatic disease, hypertension, angina pectoris, gastric or duodenal ulcers, bipolar disorder, anxiety disorder, schizophrenia, suicidal tendencies, prostatitis, or hypersensitivity to yohimbe should not use it. Prolonged use of this herb is contraindicated.

Side Effects/Adverse Reactions

CNS: Headache, anxiety, restlessness, dizziness, tremors; manic reactions in psychiatric clients

Side Effects/Adverse Reactions—cont'd

CV: Hypertension, tachycardia, flushing
GI: Nausea, vomiting, anorexia, diarrhea
GU: Dysuria, *nephrotoxicity*
INTEG: Hypersensitivity reactions

Interactions

Drug

ACE inhibitors, antihypertensives, beta-blockers, calcium channel blockers: Yohimbe may decrease or block the action of these drugs; avoid concurrent use (Musso et al, 1995).
Alpha-adrenergic blockers *(phentolamine, phenoxybenzamine)*, ***phenothiazines*** *(chlorpromazine, promazine, thioxanthene)*, ***sympathomimetics*** *(ephedrine, amphetamines, epinephrine):* Use of yohimbe with alpha-adrenergic blockers, phenothiazines, sympathomimetics may result in increased toxicity; avoid concurrent use.
CNS stimulants, SSRIs: Use of yohimbe with CNS stimulants, SSRIs may result in increased CNS stimulation; avoid concurrent use.
MAOIs *(tranylcypromine, phenelzine):* Yohimbe may increase the effects of MAOIs; avoid concurrent use (theoretical).
Tricyclic antidepressants *(clomipramine, imipramine, amitriptyline):* Use of yohimbe with tricyclic antidepressants may result in increased hypertension; dose may need to be lowered (Fugh-Berman, 2000).

Food

Caffeine-containing products: Use of yohimbe with products that contain caffeine may result in increased CNS stimulation; avoid concurrent use.
High-tyramine foods: Use of yohimbe with foods with a high tyramine content (e.g., wine, beer, aged cheese, liver) may cause increased blood pressure; avoid concurrent use.

Primary Chemical Components and Possible Actions

Chemical Class	Individual Component	Possible Action
Alkaloid	Yohimbine	Alpha-2 antagonist; increase blood pressure
	Alpha-yohimbine; Allo-yohimbine	

Client Considerations

Assess

- Assess for hypersensitivity reactions. If present, discontinue the use of yohimbe and administer an antihistamine or other appropriate therapy.
- Assess for medication use. Yohimbe interacts with many types of medications (see Interactions).

- Assess for use of caffeine-containing products and high-tyramine foods (see Interactions).
- Monitor blood pressure and pulse if the client is using yohimbe for an extended period.

Administer

- Instruct the client to store yohimbe products in a cool, dry place, away from heat and moisture.
- Inform the client that dosage may be increased to treat male erectile dysfunction; however, higher doses can lead to hypertension and tachycardia.

Teach Client/Family

- Caution the client not to use yohimbe in children or those who are pregnant or breastfeeding until more research is available. Yohimbe is usually used by males.

APPENDIX A
Herbal Resources

The following is a sampling of online resources that provide current, reliable information about herbal products, their uses, and their health effects. Some are consumer oriented, and others are intended for health professionals. The names of the sponsoring organizations' home pages are arranged alphabetically. URLs are provided for each individual site, or for the Internet portal through which the site may be accessed.

AGRICOLA (AGRICultural OnLine Access): http://agricola.nal.usda.gov/

Alternative Medicine Home Page, from the University of Pittsburgh: http://www.pitt.edu/~cbw/altm.html

American Botanical Council: http://abc.herbalgram.org/site/PageServer?pagename=Homepage

American Herbalists Guild: http://www.americanherbalistsguild.com/

American Herbal Pharmacopoeia: http://www.herbal-ahp.org/

American Holistic Health Association: http://www.ahha.org

American Holistic Medical Association: http://www.holisticmedicine.org

American Holistic Nurses Association: http://www.ahna.org

American Society of Pharmacognosy: http://www.phcog.org/

Association of Natural Medicine Pharmacists: http://www.anmp.org

British Herbal Medicine Association: http://www.bhma.info/

Christopher Hobbs Virtual Herbal: http://www.christopherhobbs.com/

Dr. Duke's Phytochemical and Ethnobotanical Databases, from the Agricultural Research Service: http://www.ars-grin.gov/duke/plants.html

European Herbal & Traditional Medicine Practitioners Association: http://www.ehpa.eu/

European Scientific Cooperative on Phytotherapy (ESCOP): http://www.escop.com/

Herb Research Foundation (HRF): http://www.herbs.org

Herbal Medicine, from Medline Plus: http://www.nlm.nih.gov/medlineplus/herbalmedicine.html

Herbs for Health, from About.com: http://altmedicine.about.com/

International Herb Association: http://www.iherb.org/

Rocky Mountain Herbal Institute: http://www.rmhiherbal.org/

RxList Alternatives: http://www.rxlist.com/script/main/art.asp?articlekey=78831

Southwest School of Botanical Medicine: http://www.swsbm.com/HOMEPAGE/HomePage.html

United Plant Savers (UpS): http://unitedplantsavers.org/

United States Pharmacopoeia (USP): http://www.usp.org/

APPENDIX B
Drug/Herb Interactions

The table that follows lists known drug/herb interactions for herbs included in this handbook. The pharmaceuticals and drug classes that are known to interact with herbal products are listed in the first column in alphabetical order, above the names of the herbs with which they interact.

The reader should not assume that an herbal product not included here may be taken safely with a given drug or class of drugs. Research into herbal products is changing constantly, and new interactions are becoming known every day. Caution is always necessary when using herbal products, particularly when the client is taking them concurrently with pharmaceuticals.

Drug/Drug Classes

Herb	Interaction
ACE inhibitors	
Kelp	May ↑ the hypotensive effects of kelp; avoid concurrent use
Morinda	May ↑ risk of hyperkalemia
Pineapple	May antagonize ACE inhibitor actions; avoid concurrent use
St. John's wort	May lead to severe photosensitivity; avoid concurrent use
Yohimbe	May ↓ or block actions of these drugs; avoid concurrent use
Acetazolamide	
Quinine	May lead to toxicity when used with acetazolamide; avoid concurrent use
Adenosine	
Guarana	May ↓ the adenosine response
Alcohol	
Arginine	May cause gastric irritation
Beta-carotene	↓ by alcohol
Betel palm	↑ effects of alcohol; avoid concurrent use
Catnip	May enhance the effects of alcohol
Clary	↑ the action of alcohol
Corkwood	May ↑ anticholinergic effect
Daisy	May ↑ the effect of alcohol
Goldenseal	May ↑ the effects of alcohol
Gossypol	Leads to alcohol accumulation
Hops	↑ CNS effects
Jamaican dogwood	↑ effects of alcohol; avoid concurrent use
St. John's wort	May ↑ MAO inhibition; avoid concurrent use
Lavender	↑ sedation when used with lavender; avoid concurrent use
Monascus	Alcohol may affect liver function in those taking monascus

Drug/Drug Classes—cont'd

Herb	Interaction
All medications	
Clematis	Avoid concurrent use with all Western medications
Fenugreek	May cause reduced absorption of all medications used concurrently
Glucomannan	May ↓ the absorption of all medications if taken concurrently; space dosages by at least 2 hours
Kaolin	↓ absorption of all drugs; space by at least 2 hours
Karaya gum	↓ absorption of all drugs; space by at least 2 hours
All oral medications	
Agar	Causes ↓ absorption of all oral medication
Bistort	May cause precipitation of some drugs; separate by the longest possible time
Flax	Absorption may ↓ if taken concurrently
Ginger	May ↑ absorption of all medications taken orally
Guar gum	May ↓ the absorption of all oral medications
Iceland moss	Can ↓ absorption of all medications
Irish moss	Can ↓ absorption of all medications
Marshmallow	May ↓ absorption of oral medications; avoid concurrent use
Mullein	May ↓ absorption of oral medications; space by 2 hours
Oats	May ↓ absorption of oral medications; space by 1 before or 4 hours after oats
Pectin	↓ absorption of all drugs, vitamins, and minerals if taken concurrently; space by 3 hours
Plantain	May ↓ absorption of all oral medications; space by several hours
Quince	May ↓ absorption of all oral medications
Alpha-adrenergic blockers	
Butcher's broom	May ↓ action of alpha-adrenergic blockers; avoid concurrent use
Capsicum	May ↓ the action of alpha-adrenergic blockers; avoid concurrent use
Yohimbe	May result in ↑ toxicity; avoid concurrent use
Aluminium salts	
Quinine	May cause ↓ absorption of quinine; space by 3 hours
Amantadine	
Jimsonweed	↑ anticholinergic effects
Aminoglycosides	
Creatine	May lead to nephrotoxicity
Lysine	Large amounts of lysine cause ↑ aminoglycoside toxicity; avoid concurrent use
Amphetamines	
Eucalyptus	May ↓ the effectiveness of amphetamines; avoid concurrent use
Khat	↑ action of amphetamines
Rauwolfia	May cause ↓ pressor effects; avoid concurrent use
St. John's wort	May cause serotonin syndrome

Continued

Drug/Drug Classes—cont'd

Herb	Interaction
Analgesics	
Cola tree	May ↑ the effect of analgesics; avoid concurrent use
Anastrozole	
DHEA	Do not take together; DHEA is a potent estrogen agonist
Anesthetics	
Ephedra	Causes ↑ arrhythmias when used with halothane anesthetics; avoid concurrent use
Anisindione	
Dong quai	May ↑ the effects of anisindione
Feverfew	May ↑ anticoagulant effects
Antacids	
Acidophilus	Should be taken 30-60 min. before acidophilus.
Angelica	May ↑ stomach acid, which may ↓ the antacid action
Bogbean	↓ the effects of antacids
Buckthorn	May ↓ the action of buckthorn if taken within 1 hour of the herb
Cascara	May ↓ the action of cascara if taken within 1 hour of the herb
Castor	To prevent ↓ absorption of castor, do not take within 1 hour of antacids
Chinese rhubarb	May ↓ the effectiveness of Chinese rhubarb if taken within 1 hour of the herb
Chromium	Calcium products reduce the absorption of chromium; space by ≥ 2 hours
Dandelion	May ↓ the action of antacids
Devil's claw	May ↓ the action of antacids
Jimsonweed	↓ the action of jimsonweed
Male fern	May ↓ the action of male fern, separate by at least 2 hours
Peppermint oil	May cause premature dissolution of enteric-coated peppermint oil
Yarrow	May ↓ the action of antacids
Antianginals	
Blue cohosh	May ↓ the action of antianginals, causing chest pain
Antianxiety agents	
Cowslip	May ↑ the effect of antianxiety agents; avoid concurrent use
Antiarrhythmics	
Aconite	↑ toxicity; avoid concurrent use
Aloe	Internal use may ↑ the effects of antiarrhythmics
Broom	May ↑ the effect of antiarrhythmics; avoid concurrent use
Buckthorn	Chronic buckthorn use can cause hypokalemia and enhance the effects of antiarrhythmics; avoid concurrent use
Cascara	Chronic cascara use can cause hypokalemia and enhance the effects of antiarrhythmics; avoid concurrent use
Chinese rhubarb	Chronic use of Chinese rhubarb can cause hypokalemia and enhance the effects of antiarrhythmics

Drug/Drug Classes—cont'd

Herb	Interaction
Devil's claw	Use cautiously because of possible inotropic and chronotropic effects
Figwort	May ↑ the effects of antiarrhythmics; avoid concurrent use
Fumitory	May ↑ the effects of antiarrhythmics; avoid concurrent use
Goldenseal	May ↑ the effects of antiarrhythmics
Khat	↑ action of antiarrhythmics
Kudzu	↑ effects of antiarrhythmics
Licorice	↑ cardiac effects of antiarrhythmics; avoid concurrent use
Squill	May ↑ effect of antiarrhythmics, causing life-threatening toxicity, avoid concurrent use
Antibiotics	
Acidophilus	Avoid concurrent use; space by at least 2 hours
Antibiotics, macrolide	
Black hellebore	Can lead to cardiac toxicity; avoid concurrent use
Lily of the valley	May lead to cardiac glycoside toxicity
Anticholinergics	
Black Catechu	May ↑ constipation when used with anticholinergics
Butterbur	May enhance the effects of anticholinergics; avoid concurrent use
Jaborandi	Internal use may ↓ effects of anticholinergics
Jimsonweed	↑ effects of anticholinergics
Anticoagulants	
Alfalfa	May prolong bleeding
Allspice	May inhibit platelets, causing bleeding
Andrographis	May ↑ effect of anticoagulants
Angelica	May prolong bleeding; avoid concurrent use
Bilberry	May ↑ action of anticoagulants
Black haw	May ↑ the action of anticoagulants
Blue flag	May ↑ risk of bleeding
Bogbean	May ↑ risk of bleeding; avoid concurrent use
Boldo	Can lead to ↑ risk of bleeding
Borage	May ↑ risk of bleeding
Buchu	Can ↑ the action of anticoagulants, causing bleeding; avoid concurrent use
Chamomile	May interfere with the actions of anticoagulants; avoid concurrent use
Chaparral	May ↑ action of anticoagulants
Chondroitin	Can cause ↑ bleeding; avoid high doses of chondroitin
Cloves	May ↑ effect of anticoagulants
Coenzyme Q10	May ↓ the action of anticoagulants; avoid concurrent use
Dandelion	May ↑ bleeding when used with anticoagulants
Fenugreek	Risk of ↑ bleeding when used concurrently
Feverfew	May ↑ anticoagulant effects
Fish oil	May ↑ risk of bleeding; avoid concurrent use
Flax	May ↑ risk of bleeding

Continued

Drug/Drug Classes—cont'd

Herb	Interaction
Gamma linolenic acid	May ↑ risk of bleeding
Garlic	May ↑ bleeding; avoid concurrent use
Ginkgo	↑ risk of bleeding; avoid concurrent use
Ginseng	May ↓ the action of anticoagulants
Glucosamine	High levels of glucosamine can lead to bleeding risk
Goldenseal	May ↓ the effects of anticoagulants
Guggul	May ↑ risk of bleeding
Horse chestnut	↑ risk of severe bleeding; avoid concurrent use
Irish moss	↑ effects of anticoagulants; avoid concurrent use
Kelp	May pose ↑ risk of bleeding; avoid concurrent use
Kelpware	May pose ↑ risk of bleeding; avoid concurrent use
Khella	↑ risk of bleeding when used with anticoagulants; avoid concurrent use
Kudzu	May ↑ risk of bleeding
Lovage	May ↑ effects of anticoagulants; avoid concurrent use
Lungwort	May ↑ effects of anticoagulants; avoid concurrent use
Meadowsweet	May ↑ risk of bleeding; avoid concurrent use
Motherwort	May cause ↑ risk of bleeding; avoid concurrent use
Mugwort	May cause ↑ risk of bleeding; avoid concurrent use
Nettle	May ↓ effect of anticoagulants; avoid concurrent use
Papaya	↑ risk of bleeding and ↑ INR and prothrombin time
Pineapple	May ↑ bleeding time when used with anticoagulants; avoid concurrent use
Poplar	May ↑ bleeding time when used with anticoagulants; avoid concurrent use
Prickly ash	May ↑ bleeding time when used with anticoagulants; avoid concurrent use
Quinine	May ↑ action of anticoagulants; avoid concurrent use
Saw palmetto	May potentiate anticoagulant effect of salicylates; avoid concurrent use
Senega	May ↑ bleeding time; avoid concurrent use
Tonka bean	May result in ↑ risk of bleeding; avoid concurrent use
Turmeric	May result in ↑ risk of bleeding; avoid concurrent use
Wintergreen	May cause ↑ risk of bleeding; avoid concurrent use
Yarrow	May result in ↑ risk of bleeding; avoid concurrent use
Anticoagulants, oral	
Dong quai	May ↑ the effects of anticoagulants
Anticonvulsants	
Borage	May ↓ effect of anticonvulsants
Fennel	May ↑ risk of seizures; avoid concurrent use
Ginkgo	May ↓ the anticonvulsant effect; avoid concurrent use
Glutamine	May ↓ anticonvulsant action of anticonvulsants; avoid concurrent use
Wormseed	May ↓ the seizure threshold; avoid concurrent use

Drug/Drug Classes—cont'd

Herb	Interaction
Antidepressants	
Hops	↑ CNS effects
SAM-e	May lead to serotonin syndrome; avoid concurrent use
St. John's wort	May cause serotonin syndrome
Antidiabetics	
Agrimony	May ↑ hypoglycemic effect; monitor blood glucose
Alfalfa	May potentiate hypoglycemic action
Aloe	Internal use may ↑ effects of antidiabetics
Basil	May ↑ hypoglycemic effects; avoid concurrent use
Bay	May ↑ hypoglycemic effects; avoid concurrent use
Bee pollen	↓ effectiveness of antidiabetics, ↑ hyperglycemia; avoid concurrent use
Bilberry	May ↑ hypoglycemia
Blue cohosh	May ↓ the action of antidiabetics; avoid concurrent use
Broom	Broom ↓ the hypoglycemic effect; avoid concurrent use
Buchu	Buchu ↓ the hypoglycemic effect; avoid concurrent use
Bugleweed	May lead to ↑ hypoglycemia
Burdock	↑ hypoglycemic effect can occur; avoid concurrent use
Chinese cucumber	May ↑ effects of antidiabetics
Chromium	May reduce the action of antidiabetics
Coenzyme Q10	May ↓ the action of coenzyme Q10 and deplete endogenous stores; avoid concurrent use
Coriander	May ↑ the effects of oral antidiabetics; use together cautiously
Couchgrass	May ↑ hyperglycemia
Damiana	May ↓ the action of antidiabetics
Dandelion	May ↑ the effects of antidiabetics; avoid concurrent use
Devil's claw	May cause an additive effect
Ephedra	May ↑ blood glucose
Eucalyptus	May alter the effectiveness of antidiabetics; avoid concurrent use
Eyebright	Internal use may ↑ the effects of antidiabetics
Figwort	May ↑ blood glucose levels, ↓ antidiabetic action of insulin
Flax	May ↑ action of antidiabetics
Fo-ti	May ↑ action of antidiabetics
Garlic	Because of hypoglycemic effects of garlic, oral antidiabetic dosages may need to be adjusted
Ginseng	May ↑ the hypoglycemic effects of oral antidiabetics; avoid concurrent use
Glucomannan	May ↑ the hypoglycemic effects of oral antidiabetics
Gotu kola	May ↓ the effectiveness of antidiabetics; avoid concurrent use
Horse chestnut	↑ hypoglycemic effects
Maitake	May ↑ the action of antidiabetics
Marshmallow	May ↑ hypoglycemic action of antidiabetics
Myrrh	May cause ↑ hypoglycemic effects; avoid concurrent use
Myrtle	May cause ↑ hypoglycemia; avoid concurrent use

Continued

Drug/Drug Classes—cont'd

Herb	Interaction
Plantain	May ↑ antidiabetic action
Sage	May ↑ the action of antidiabetics
Senega	May ↓ effects of antidiabetics; avoid concurrent use
Siberian ginseng	May ↑ levels of antidiabetics; avoid concurrent use
Yerba Maté	May ↓ the action of antidiabetics
Antidiarrheals	
Nutmeg	May potentiate antidiarrheals; monitor for constipation
Antifungals	
Gossypol	May cause nephrotoxicity; avoid concurrent use
Antifungals, azole	
Bitter orange	Can inhibit cytochrome P450 3A4 and ↑ drug levels
Goldenseal	May slow the metabolism of azole antifungals
Licorice	May ↑ levels of azole antifungals; avoid concurrent use
Antiglaucoma agents	
Betel palm	↓ effects of antiglaucoma agents; avoid concurrent use
Antihistamines	
Blue cohosh	Metabolism of blue cohosh may be ↓
Corkwood	May ↑ anticholinergic effect
Hops	↑ CNS effects
Jamaican dogwood	May produce ↑ effect; avoid concurrent use
Khat	↑ action of antihistamines
Lavender	↑ sedation when used with lavender; avoid concurrent use
Antihypertensives	
Aconite	↑ toxicity; avoid concurrent use
Agrimony	Use with anti-hypertensives may ↑ hypotension
Andrographis	May ↑ effect of antihypertensives
Arnica	Internal use may ↓ the effect of antihypertensives
Arginine	May lead to ↑ hypotension
Astragalus	May ↑ or ↓ action of anti-hypertensives; avoid concurrent use
Barberry	May ↑ antihypertensive action
Bayberry	Bayberry's tannin may ↑ sodium and water retention
Betony	May ↑ action of antihypertensives; avoid concurrent use
Black catechu	May ↑ hypotension
Black cohosh	↑ action of antihypertensives
Bloodroot	May ↑ hypotensive effects
Blue cohosh	↓ the action of antihypertensives; avoid concurrent use
Blue flag	May ↑ effect of antihypertensives
Broom	May ↑ the effect of antihypertensives; avoid concurrent use
Burdock	May ↑ hypotensive effects; avoid concurrent use
Cat's claw	May ↑ the hypotensive effects of antihypertensives; avoid concurrent use
Celery	May ↑ effect of antihypertensives

Drug/Drug Classes—cont'd

Herb	Interaction
Cowslip	May ↑ effect of antihypertensives
Dandelion	May ↑ the effects of antihypertensives; avoid concurrent use
Goldenseal	May ↑ the effects of antihypertensives
Hawthorn	May ↑ hypotension; avoid concurrent use
Irish moss	↑ effects of antihypertensives; avoid concurrent use
Jamaican dogwood	May ↑ effects of antihypertensives; avoid concurrent use
Kelp	↑ hypotensive effects; avoid concurrent use
Khat	↑ action of antihypertensives
Khella	↑ hypotension when used with antihypertensives; avoid concurrent use
Licorice	May cause ↑ hypokalemia; avoid concurrent use
Mistletoe, European	May ↑ hypotensive effect of antihypertensives; avoid concurrent use
Parsley	May cause ↑ hypotension; avoid concurrent use
Queen Anne's lace	↑ hypotension when used with antihypertensives; use together cautiously
Rue	May cause ↑ vasodilation; avoid concurrent use
Yarrow	May result in ↑ hypotension; avoid concurrent use
Yohimbe	May ↓ or block actions of these drugs; avoid concurrent use
Antilipidemics	
Glucomannan	May ↑ the action of antilipidemics
Gotu kola	May ↓ the effectiveness of antilipidemics; avoid concurrent use
Antimigraine agents	
Butterbur	May enhance the effects of antimigraine agents; use cautiously
Antineoplastics	
Acidophilus	Should not be used concurrently
Milk thistle	May prevent nephrotoxicity from platinum antineoplastics
Yew	May cause ↑ myelosuppression; avoid concurrent use
Antiparkinson agents	
Corkwood	May interfere with effect of antiparkinson agents
Kava	↑ symptoms of parkinsonism; avoid concurrent use
Antiplatelet agents	
Allspice	May inhibit platelets, causing bleeding
Andrographis	May ↑ effect of antiplatelet agents
Angelica	Many species ↑ prothrombin time and prolong bleeding; avoid concurrent use
Arginine	May cause gastric irritation
Bilberry	May cause antiaggregation of platelets
Blue flag	May ↑ risk of bleeding
Bogbean	May ↑ risk of bleeding; avoid concurrent use
Boldo	Can lead to ↑ risk of bleeding
Buchu	Can ↑ the action of anticoagulants, causing bleeding; avoid concurrent use

Continued

Drug/Drug Classes—cont'd

Herb	Interaction
Chaparral	May ↑ action of antiplatelet agents
Cloves	May ↑ effect of antiplatelet agents
Dandelion	May ↑ bleeding when used with antiplatelet agents
Dong quai	May ↑ the effects of antiplatelet agents
Fenugreek	Risk of ↑ bleeding when used concurrently
Feverfew	May ↑ action of antiplatelets; avoid concurrent use
Flax	May ↑ risk of bleeding
Gamma linolenic acid	May ↑ risk of bleeding
Garlic	May ↑ bleeding; avoid concurrent use
Ginkgo	↑ risk of bleeding; avoid concurrent use
Ginseng	May ↓ action of antiplatelets
Glucosamine	High levels of glucosamine can lead to bleeding risk
Guggul	May ↑ risk of bleeding
Kudzu	May ↑ risk of bleeding
Saw palmetto	May lead to ↑ bleeding; avoid concurrent use
Tonka bean	May result in ↑ risk of bleeding; avoid concurrent use
Turmeric	May result in ↑ risk of bleeding; avoid concurrent use
Yarrow	May result in ↑ risk of bleeding; avoid concurrent use
Antipsychotics	
Hops	↑ CNS effects
Kava	May result in neuroleptic movement disorders
Antiretrovirals	
St. John's wort	When taken PO in combination with indinavir May ↑ the antiretroviral action
Ascorbic acid	
Chromium	Both chromium and ascorbic acid absorption ↑ when taken concurrently
Aspirin	
Bilberry	May ↑ the anticoagulation action of aspirin
Bogbean	May ↑ risk of bleeding; avoid concurrent use
Horse chestnut	↑ risk of severe bleeding; avoid concurrent use
Parsley	May precipitate parsley allergy
Atropine	
Black root	Forms an insoluble complex with atropine; avoid concurrent use
Barbiturates	
Blue cohosh	Metabolism of blue cohosh may be ↓
Blue flag	Effects may be ↓
Eucalyptus	May ↓ the effectiveness of barbiturates; avoid concurrent use
Jamaican dogwood	↑ effects of barbiturates; avoid concurrent use
Kava	↑ sedation
Lemon balm	May potentiate the sedative effects of barbiturates

Drug/Drug Classes—cont'd

Herb	Interaction
Belladonna alkaloids	
Mayapple	May ↓ laxative effects of mayapple; avoid concurrent use
Benzodiazipines	
Bitter orange	Can inhibit cytochrome P450 3A4 and ↑ drug levels
Coffee	↓ the effect of benzodiazepines
Cola tree	May ↓ the effect of cola tree products
Goldenseal	May slow the metabolism of benzodiazepines
Kava	↑ sedation and coma; avoid concurrent use
Melatonin	May ↑ anxiolytic effects of benzodiazepines; use cautiously
Beta-blockers	
Betel palm	↑ action of beta-blockers; avoid concurrent use
Blue flag	Effects may be ↓
Butterbur	May enhance the effects of beta-blockers; avoid concurrent use
Chaste tree	May lead to hypertensive crisis
Coenzyme Q10	Beta-blockers may ↓ the action of coenzyme Q10 and deplete endogenous stores; avoid concurrent use
Coffee	Caffeine in coffee ↑ blood pressure in those taking beta-blockers
Cola tree	May ↑ blood pressure when used with beta-blockers
Corkwood	May alter cardiac function
Ephedra	Causes ↑ hypertension when used with beta-blockers; avoid concurrent use
Figwort	May ↑ the effects of beta-blockers; avoid concurrent use
Fumitory	May ↑ the effects of beta-blockers; avoid concurrent use
Goldenseal	May ↑ the effects of beta-blockers
Green tea	May lead to ↑ inotropic effects
Jaborandi	Internal use may ↑ adverse cardiovascular reactions; avoid concurrent use
Khat	↑ action of beta blockers
Lily of the valley	↑ risk of bradycardia; avoid concurrent use
Melatonin	Melatonin is able to reverse the negative action of beta-blockers on sleep
Motherwort	May cause ↓ heart rate; avoid concurrent use
Plaintain	May ↑ effects of beta-blockers; avoid concurrent use
Rauwolfia	May result in ↑ hypotension; avoid concurrent use
Squill	May ↑ effect of beta-blockers, causing life-threatening toxicity; avoid concurrent use
Yohimbe	May ↓ or block actions of these drugs; avoid concurrent use
Bethanecol	
Jaborandi	Internal use ↑ cholinergic effects
Bronchodilators	
Coffee	Large amounts of coffee may ↑ the action of some bronchodilators
Green tea	Large amounts of green tea ↑ the action of some bronchodilators
Guarana	May ↑ the action of bronchodilators

Continued

Drug/Drug Classes—cont'd

Herb	Interaction
Buspirone	
Ginkgo	May cause hypomania
Calcium	
Lysine	↑ calcium absorption, ↓ urine calcium loss
Oleander	May ↑ the action of oleander
Raspberry	Raspberry tea may ↓ absorption of calcium
Sorrel	May ↓ calcium absorption
Yellow dock	Tea may ↓ the absorption of calcium
Calcium-channel blockers	
Barberry	May ↑ effect of calcium-channel blockers
Betel palm	↑ action of calcium-channel blockers; avoid concurrent use
Bitter orange	Can inhibit cytochrome P450 3A4 and ↑ drug levels
Burdock	May ↑ hypotensive effects; avoid concurrent use
Goldenseal	May slow the metabolism of calcium-channel blockers
Khat	↑ action of calcium-channel blockers
Khella	↑ hypotension when used with calcium-channel blockers; avoid concurrent use
Lily of the valley	↑ risk of bradycardia; avoid concurrent use
Plaintain	May ↑ effects of calcium-channel blockers; avoid concurrent use
Squill	May ↑ effect of calcium-channel blockers, causing life-threatening toxicity; avoid concurrent use
Yohimbe	May ↓ or block actions of these drugs; avoid concurrent use
Calcium supplements	
Chromium	Calcium products reduce the absorption of chromium; space by ≥ 2 hours
Shark cartilage	May lead to ↑ calcium levels
Carbamazepine	
Plantain	May ↓ effects of carbamazepine; avoid concurrent use
Quinine	May ↑ the action of carbamazepine; avoid concurrent use
Carbidopa	
Octacosanol	May cause dyskinesia when used with carbidopa/levodopa; avoid concurrent use
Cardiac agents	
Plantain	May ↑ effects of cardiac agents; avoid concurrent use
Rauwolfia	May result in ↑ hypotension; avoid concurrent use
Squill	May ↑ effect of cardiac agents, causing life-threatening toxicity; avoid concurrent use
Cardiac glycosides	
Aconite	↑ toxicity; avoid concurrent use
Aloe	Internal use may ↑ effects of cardiac glycosides
Betel palm	↑ action of cardiac glycosides; avoid concurrent use
Beth root	May ↓ effects of cardiac glycosides

Drug/Drug Classes—cont'd

Herb	Interaction
Black root	Forms an insoluble complex with cardiac glycosides; avoid concurrent use
Black hellebore	Can lead to additive effect; avoid concurrent use
Blue flag	May lead to ↑ side effects
Broom	May ↑ the effect of cardiac glycosides; avoid concurrent use
Buckthorn	Chronic buckthorn use can cause hypokalemia and enhance the effects of cardiac glycosides; avoid concurrent use
Cascara	Chronic cascara use can cause hypokalemia and enhance the effects of cardiac glycosides; avoid concurrent use
Castor	Use with castor oil may lead to ↑ cardiac adverse reactions
Chinese rhubarb	Chronic use of Chinese rhubarb can cause hypokalemia and enhance the effects of cardiac glycosides
Condurango	Absorption of digitoxin and digoxin may ↓; avoid concurrent use
Corkwood	May alter cardiac function
Ephedra	May change heart rhythm; avoid concurrent use
Figwort	May ↑ the action of figwort; avoid concurrent use
Fumitory	May ↑ the effects of cardiac glycosides; avoid concurrent use
Goldenseal	May ↓ the effects of cardiac glycosides
Hawthorn	May ↑ the effects of cardiac glycosides; monitor concurrent use carefully
Horsetail	↑ toxicity and ↑ hypokalemia
Kelp	May lead to hypokalemia
Khat	↑ action of cardiac glycosides
Kudzu	↑ effects of cardiac glycosides
Licorice	May cause ↑ toxicity and ↑ hypokalemia; avoid concurrent use.
Lily of the valley	May ↑ effects; avoid concurrent use
Mayapple	Do not use together; may ↑ toxicity
Mistletoe, European	May cause ↓ cardiac function; avoid concurrent use
Motherwort	May cause ↓ heart rate; avoid concurrent use
Night-blooming cereus	May ↑ actions of cardiac glycosides; avoid concurrent use
Oleander	May cause fatal digitalis toxicity; avoid concurrent use
Plantain	May ↑ effects of cardiac glycosides; avoid concurrent use
Queen Anne's lace	May ↑ cardiac depression; avoid concurrent use
Quinine	May ↑ action of cardiac glycosides; avoid concurrent use
Rauwolfia	Causes severe bradycardia; do not use together
Rue	May cause ↑ inotropic effects; avoid concurrent use
Senna	Chronic use may potentiate cardiac glycosides
Siberian ginseng	May ↑ levels of cardiac glycosides; avoid concurrent use
Squill	May ↑ effect of cardiac glycosides, causing life-threatening toxicity; avoid concurrent use

Continued

Drug/Drug Classes—cont'd

Herb	Interaction
Central nervous system (CNS) depressants	
Bay	May ↑ the action of CNS depressants; avoid concurrent use
Bloodroot	May ↑ sedative effect of CNS depressants
Boldo	May ↑ effect of CNS depressants
Catnip	May enhance the effects of sedatives
Chamomile	May ↑ the effects of other sedatives; avoid concurrent use
Cowslip	May ↑ the effect of antianxiety agents and sedative/hypnotics; avoid concurrent use
Elecampane	May ↑ the action of CNS depressants
Golden rod	May ↑ CNS depression
Goldenseal	May ↑ the effects of CNS depressants
Hawthorn	May ↑ the sedative effects of CNS depressants; avoid concurrent use
Hops	↑ CNS effects
Kava	↑ sedation; avoid concurrent use
Lavender	May ↑ sedation; avoid concurrent use
Lemon balm	May potentiate the sedative effects of CNS depressants
Marigold	May ↑ sedation
Marijuana	↑ effect of CNS depressants
Motherwort	Can ↑ the action of CNS depressants
Nettle	May lead to ↑ CNS depression
Pokeweed	May ↑ action of CNS depressants; avoid concurrent use
Poppy	↑ CNS depression when use with CNS depressants; avoid concurrent use
Queen Anne's lace	↑ action of CNS depressants; use together cautiously
Rauwolfia	May cause ↑ CNS depression; avoid concurrent use
Sage	May ↑ the action of CNS depressants
Sassafras	May ↑ the action of CNS depressants
Senega	May cause ↑ CNS effects; avoid concurrent use
Skullcap	May potentiate sedation of CNS depressants; avoid concurrent use
Valerian	May ↑ effects of CNS depressants; avoid concurrent use
Yarrow	May cause ↑ sedation; avoid concurrent use
Yerba maté	May produce antagonistic effect; avoid concurrent use
Central nervous system (CNS) stimulants	
Ephedra	Causes ↑ CNS stimulation when used with CNS stimulants
Peyote	May ↑ CNS stimulation
Squill	May ↑ effects of CNS stimulants; avoid concurrent use
Yerba maté	May ↑ effects CNS stimulants, use together cautiously
Yohimbe	May result in ↑ CNS stimulation; avoid concurrent use
Cerebral stimulants	
Melatonin	May have a synergistic effect and exacerbate insomnia; avoid concurrent use
Cholinergics	
Betel palm	May ↑ the effects of cholinergics; avoid concurrent use

Drug/Drug Classes—cont'd

Herb	Interaction
Cholinergics, ophthalmic	
Jaborandi	Internal use ↑ cholinergic effects
Ciprofloxacin	
Fennel	Affects the absorption, distribution, and elimination of ciprofloxacin; dosages should be spaced by at least 2 hours
Clonidine	
Capsicum	May ↓ the antihypertensive effects of clonidine; avoid concurrent use
Contraceptives, hormonal	
Alfalfa	May interfere with hormonal contraceptives
Black cohosh	May ↑ effects; avoid concurrent use
Blue cohosh	May ↑ metabolism, ↓ effect of hormonal contraceptives
Chaste tree	May interfere with the action of hormonal contraceptives; avoid concurrent use
Dong quai	May ↑ effects of hormonal contraceptives
Garlic	Garlic with allicin may ↓ the action of hormonal contraceptives
Kudzu	May ↑ action of hormonal contraceptives
St. John's wort	May lead to severe photosensitivity; avoid concurrent use
Corticosteroids	
Bloodroot	May ↑ potassium loss
Blue cohosh	May ↑ metabolism, ↓ effect of corticosteroids
Buckthorn	Hypokalemia can result from use of buckthorn with corticosteroids; avoid concurrent use
Cascara	Hypokalemia may result; avoid concurrent use
Castor	Use with castor oil may ↑ hypokalemia
Chinese rhubarb	Chronic use of Chinese rhubarb can cause hypokalemia and enhance the effects of corticosteroids
DHEA	Corticosteroids ↓ DHEA levels
Licorice	May ↑ effects of corticosteroids; avoid concurrent use
Perilla	May augment the effects of corticosteroids; avoid concurrent use
Cyclophosphamide	
Astragalus	May ↓ the effect of cyclophosphamide
Cyclosporine	
Arginine	May counteract the therapeutic effects of cyclosporine
Creatine	May lead to nephrotoxicity
CYP2A6, drugs metabolized by	
Condurango	Use condurango with caution
CYP450, drugs metabolized by	
Black pepper	Avoid concurrent use
Condurango	Use condurango with caution, especially in clients with hepatic disorders
Hops	↓ CYP450 levels
Myrtle	Avoid concurrent use
Pennyroyal	Avoid concurrent use

Continued

Drug/Drug Classes—cont'd

Herb	Interaction
CYP452C9, drugs metabolized by	
Cranberry	May inhibit cytochrome P45 2C9 enzymes
CYP4503A4, drugs metabolized by	
Bitter orange	Can inhibit CYP4503A4 and ↑ drug levels
DHEA	May ↓ the action of drugs metabolized by CYP4503A4
CYP4501A2, drugs metabolized by	
Ginkgo	May affect drugs metabolized by this enzyme; use cautiously
Kava	Kava significantly ↓ these substrates; use cautiously
Siberian ginseng	Standardized Siberian ginseng may inhibit these drugs
St. John's wort	Induces this enzyme system
CYP4502B6, drugs metabolized by	
Licorice	May ↓ the action of these drugs
CYP4502C9, drugs metabolized by	
Kava	Kava significantly ↓ these substrates; use cautiously
Milk thistle	May inhibit these drugs
Siberian ginseng	Standardized Siberian ginseng may inhibit these drugs
St. John's wort	Induces this enzyme system
CYP4502C19, drugs metabolized by	
Kava	Kava significantly ↓ these substrates; use cautiously
CYP4502D6, drugs metabolized by	
Ginkgo	May affect drugs metabolized by this enzyme; use cautiously
Kava	Kava significantly ↓ these substrates; use cautiously
Siberian ginseng	Standardized Siberian ginseng may inhibit these drugs
CYP4503A4, drugs metabolized by	
Echinacea	May inhibit P4503A4 enzymes
Garlic	Garlic with allicin may ↑ the action of cytochrome P4503A4
Ginkgo	May affect drugs metabolized by this enzyme; use cautiously
Kava	Kava significantly ↓ these substrates; use cautiously
Licorice	May ↓ the action of these drugs
Milk thistle	May inhibit these drugs
Monascus	May ↑ adverse reactions
Peppermint oil	May ↓ drug level
Siberian ginseng	Standardized Siberian ginseng may inhibit these drugs
St. John's wort	Induces this enzyme system
Valerian	May inhibit the enzyme
Wild cherry	May slow metabolism; avoid concurrent use
Decongestants	
Khat	↑ action of decongestants
Melatonin	May ↓ cytokine production; avoid concurrent use

Drug/Drug Classes—cont'd

Herb	Interaction
Dicumarol	
Dong quai	May ↑ the effects of dicumarol
Feverfew	May ↑ anticoagulant effects
Didanosine	
Lentinan	May ↑ CD4 counts
Digoxin	
Castor	Use with castor oil may lead to ↑ cardiac adverse reactions
Condurango	Absorption of digitoxin and digoxin may ↓; avoid concurrent use
Pectin	Can interfere with absorption of digoxin
Diltiazem	
Guggul	Can lead to ↑ action of diltiazem
Disulfiram	
Senna	Do not use with disulfiram
Diuretics	
Bearberry	May lead to electrolyte loss, primarily hypokalemia
Birch	May ↓ action of diuretics
Black hellebore	Can lead to toxicity; avoid concurrent use
Black root	May ↑ hypokalemia; avoid concurrent use or added potassium supplementation may be needed
Blue flag	May lead to hypokalemia
Castor	Use with castor oil may ↑ hypokalemia
Celery	May ↑ effect of diuretics
Couchgrass	Potassium wasting diuretics with couchgrass may lead to hypokalemia
Castor	May ↑ hypokalemia
Cowslip	May ↑ the effect of diuretics
Cucumber	May ↑ the diuretic effect of other diuretics; avoid concurrent use
Dandelion	May ↑ diuresis, leading to fluid loss and electrolyte imbalances; avoid concurrent use
Fo-ti	May ↑ risk of hypokalemia with potassium-losing diuretics
Golden rod	May ↑ diuretics
Gossypol	May cause severe hypokalemia; avoid concurrent use
Kelpware	May ↓ the action of diuretics
Khella	↑ hypotension when used with diuretics; avoid concurrent use
Licorice	May cause ↑ hypokalemia; avoid concurrent use
Lovage	May ↑ sodium retention
Nettle	May ↑ effects of diuretics, resulting in dehydration and hypokalemia; avoid concurrent use
Pumpkin	May ↑ action of diuretics; use together cautiously
Queen Anne's lace	↑ hypotension; use together cautiously
Rauwolfia	May result in ↑ hypotension; avoid concurrent use
Sorrel	Leads to additive diuretic effect; avoid concurrent use
Yerba maté	May ↑ effects of diuretics; avoid concurrent use

Continued

Drug/Drug Classes—cont'd

Herb	Interaction
Diuretics, loop	
Aloe	Internal use may ↑ effects of loop diuretics
St. John's wort	May lead to severe photosensitivity; avoid concurrent use
Diuretics, potassium-depleting	
Lily of the valley	May lead to hypokalemia
Diuretics, potassium-losing	
Mayapple	May ↑ hypokalemia
Diuretics, potassium-sparing	
Kelp	May lead to hypokalemia
Morinda	Morinda juice may ↑ risk of hyperkalemia
Diuretics, thiazide	
Buckthorn	Hypokalemia can result from use of buckthorn with thiazide diuretics; avoid concurrent use
Cascara	Hypokalemia may result; avoid concurrent use
Chinese rhubarb	Chronic use of Chinese rhubarb can cause hypokalemia and enhance the effects of thiazide diuretics; avoid concurrent use
St. John's wort	May lead to severe photosensitivity; avoid concurrent use
Docetaxel	
Black cohosh	May ↑ toxicity of docetaxel; avoid concurrent use
Doxazosin	
Angelica	May ↑ effect of doxazosin
Doxorubicin	
Black cohosh	May ↑ toxicity of doxorubicin; avoid concurrent use
Econazole vaginal cream	
Echinacea	May ↓ the action of this cream; avoid concurrent use
Electrolyte solutions	
Agar	↑ dehydration
Ephedrine	
Rauwolfia	May cause ↓ pressor effects; avoid concurrent use
Epinephrine	
Rauwolfia	May cause ↓ pressor effects; avoid concurrent use
Estrogens	
Alfalfa	May interfere with hormonal replacement therapy or contraceptives
Androstenediol	↑ effect of estrogens
Boron	May ↑ effect of estrogens
Chaste tree	May interfere with action of estrogens; avoid concurrent use
Dong quai	May ↑ effect of estrogens
Kudzu	May ↑ action of estrogens

Drug/Drug Classes—cont'd

Herb	Interaction
Queen Anne's lace	May interfere with estrogen's action
Soy	May interfere with estrogen absorption; avoid concurrent use
Exemestane	
DHEA	Do not take together; DHEA is a potent estrogen agonist
Fluoxetine	
Ginkgo	May cause hypomania
Fulvestrant	
DHEA	Do not take together; DHEA is a potent estrogen agonist
Furoquinolones	
Cola tree	May ↑ the effect of cola tree products
Glucocorticoids	
Squill	May ↑ effects of glucocorticoids; avoid concurrent use
Glucose	
Creatine	May ↑ the storage of creatine in muscle tissue
Guanethidine	
Ephedra	May ↓ the effect of guanethidine
H_2 blockers	
Angelica	May ↑ stomach acid, which may ↓ the H_2 blocker action
Dandelion	May ↓ the action of H_2 blockers
Devil's claw	May ↓ the action of H_2 blockers
Male fern	May ↓ the action of male fern; separate by at least 2 hours
Peppermint oil	May cause premature dissolution of enteric-coated peppermint oil
Yarrow	May ↓ the action of H_2 blockers
Hepatotoxic agents	
Black root	Avoid concurrent use
Borage	May lead to ↑ hepatotoxicity
HMG-CoA reductase inhibitors	
Coenzyme Q10	HMG-CoA reductase inhibitors may ↓ the action of coenzyme Q10 and deplete endogenous stores; avoid concurrent use
Lavender	May ↓ the action of HMG-CoA reductase inhibitors
Male fern	May cause hepatotoxicity if used together; avoid concurrent use
Monascus	May ↑ adverse reactions
Hormone replacement therapy	
Alfalfa	May interfere with hormonal replacement therapy
Black cohosh	May alter the effects of other hormone replacement therapies
DHEA	May interfere with estrogen and androgen therapy; avoid concurrent use
Hormones (animal)	
Cat's claw	May interact with hormones made from animal products; avoid concurrent use

Continued

Drug/Drug Classes—cont'd

Herb	Interaction
Hypoglycemics, oral	
Bitter melon	May ↑ effects of oral hypoglycemics
Immunomodulators	
Echinacea	May ↓ the effects of immunosuppressants; should not be used immediately before, during, or after transplant surgery
Immunostimulants	
Cat's claw	Avoid concurrent use
Immunosuppressants	
Acidophilus	Avoid concurrent use
Andrographis	May ↓ action of immunosuppressants
Astragalus	May interfere with immunosuppressant therapy
Bitter orange	Can inhibit cytochrome P450 3A4 and ↑ drug levels
Cat's claw	Will ↓ immunosuppressant therapy; avoid concurrent use
Ginseng	May diminish the effect of immunosuppressants; do not use before, during, or after transplant surgery
Maitake	May ↓ effects of immunosuppressants; do not use immediately before, during, or after transplant surgery.
Melatonin	May ↓ response to immunosuppressants
Mistletoe, European	May stimulate immunity; avoid concurrent use
Morinda	May ↓ effects of immunosuppressants
Saw palmetto	May ↑ or ↓ immunostimulant effects; avoid concurrent use
Schisandra	May ↓ effectiveness of immunosuppressants, avoid use before, during, or after transplant surgery
Skullcap	May ↓ effects of immunosuppressants; avoid concurrent use
St. John's wort	Rejection of transplanted hearts has occurred when taken PO with cyclosporine; other immunosuppressants may have same interaction in this and other transplants
Thymus Extract	Should not be used concurrently unless the extract is certified to be pathogen free
Turmeric	May ↓ effectiveness of immunosuppressants; avoid concurrent use
Insulin	
Alfalfa	May potentiate hypoglycemic action; use cautiously
Basil	May ↑ hypoglycemic effects; avoid concurrent use
Bay	May ↑ hypoglycemic effects; avoid concurrent use
Bee pollen	↓ effectiveness of insulin, ↑ hyperglycemia; avoid concurrent use
Bilberry	May significantly ↓ blood sugar levels; monitor carefully
Cat's claw	May interact with insulin; avoid concurrent use
Dandelion	May ↑ the effects of insulin; avoid concurrent use
Eucalyptus	May alter the effectiveness of insulin; avoid concurrent use
Garlic	Because of garlic's hypoglycemic effects, insulin dosages may need to be adjusted
Ginseng	May ↑ the hypoglycemic effects of insulin; avoid concurrent use
Glucomannan	May ↑ the hypoglycemic effects of insulin

Drug/Drug Classes—cont'd

Herb	Interaction
Guar gum	May delay glucose absorption when used concurrently; insulin dose may need to be ↓
Interferon	
Astragalus	May prevent or shorten upper respiratory infections
Interleukin-2	
Astragalus	May ↑ or ↓ effect of drugs such as interleukin-2
Ipecac	May ↓ laxative effects of mayapple; avoid concurrent use
Iron	
Anise	May ↑ action of iron; avoid concurrent use
Bilberry	Interferes with iron absorption; avoid concurrent use
Chromium	↓ chromium absorption when taken concurrently
Rose hips	↑ oral iron absorption
Sorrel	May ↓ iron absorption
Yellow dock	May ↓ absorption of iron; space by 2 hours
Iron salts	
Artichoke	May interfere with the absorption of iron salts
Black catechu	Forms an insoluble complex; avoid concurrent use
Condurango	Iron absorption may be ↓; avoid concurrent use
Elderberry	Tea may prevent absorption of iron salts; space by at least 2 hours
Eyebright	Tea may interfere with absorption of iron salts; space by at least 2 hours
Gentian	May interfere with absorption of iron salts; space by at least 2 hours
Ground ivy	May ↓ absorption of iron salts; avoid concurrent use
Hawthorn	May ↓ absorption of iron salts; space by at least 2 hours
Hops	↓ absorption of iron salts; space by at least 2 hours
Horehound	↓ absorption of iron salts; space by 2 hours
Horse chestnut	↓ absorption of iron salts; space by 2 hours
Lady's mantle	↓ absorption of iron salts; space by 2 hours
Lavender	↓ absorption of iron salts; space by 2 hours
Lemon balm	↓ absorption of iron salts; space by 2 hours
Marshmallow	May ↓ absorption of iron salts; space by 2 hours
Meadowsweet	May ↓ absorption of iron salts; space by 2 hours
Mistletoe, European	May ↓ absorption of iron salts; space by 2 hours
Motherwort	May ↓ absorption of iron salts; space by 2 hours
Nettle	May interfere with absorption of iron salts
Oak	May ↓ absorption of iron salts
Plantain	May ↓ absorption of iron salts
Poplar	May ↓ absorption of iron salts; space by 2 hours
Prickly ash	May ↓ absorption of iron salts; space by 2 hours
Raspberry	Raspberry tea may ↓ absorption of iron salts
Sage	May ↓ absorption of iron salts; space by 2 hours
Slippery elm	May ↓ absorption of iron salts; space by 2 hours
Squill	May ↓ absorption of iron salts; space by 2 hours

Continued

Drug/Drug Classes—cont'd

Herb	Interaction
Valerian	May interfere with absorption of iron salts; space by 2 hours
Witch hazel	May ↓ absorption of iron salts; space by 2 hours
Yarrow	May ↓ absorption of iron salts; space by 2 hours
Isoproterenol	
Rauwolfia	May cause ↓ pressor effects; avoid concurrent use
Kanamycin	
Siberian ginseng	May ↑ action of kanamycin
Laxatives	
Bogbean	May ↑ effect of laxatives
Castor	May lead to electrolyte imbalances
Flax	May ↑ the action of laxatives
Senna	Additive effect can occur; avoid concurrent use
Squill	May ↑ effects of laxatives; avoid concurrent use
Letrozole	
DHEA	Do not take together; DHEA is a potent estrogen agonist
Levodopa	
Octacosanol	May cause dyskinesia when used with carbidopa/levodopa; avoid concurrent use
Rauwolfia	↓ effect of levodopa, with ↑ extrapyramidal motor symptoms; avoid concurrent use
Lithium	
Coffee	↓ levels of lithium
Cola tree	May ↓ the effect of cola tree products
Dandelion	Toxicity may occur if used concurrently
Golden rod	May result in dehydration and lithium toxicity; avoid concurrent use
Horsetail	May cause dehydration and lithium toxicity
Juniper	Dehydration and lithium toxicity
Nettle	May result in dehydration, lithium toxicity
Parsley	May lead to dehydration, lithium toxicity
Plantain	May ↓ effects of lithium; avoid concurrent use
Lovastatin	
Pectin	Can interfere with absorption of lovastatin
Magnesium	
Melatonin	↑ inhibition of N-methyl-D-aspartate receptors; avoid concurrent use
Quinine	May cause ↓ absorption of quinine; space by 3 hours
Raspberry	Raspberry tea may ↓ absorption of magnesium
MAOIs	
Betel palm	May ↑ chance of hypertensive crisis
Bitter orange	Concurrent use may ↑ blood pressure
Broom, scotch	May cause hypertensive crisis; avoid concurrent use
Cacao tree	May ↑ the vasopressor effect of MAOIs; avoid concurrent use
Capsicum	May precipitate hypertensive crisis; avoid concurrent use
Chaparral	May ↓ effect of MAOIs

Drug/Drug Classes—cont'd

Herb	Interaction
Coffee	Large amounts of coffee should be avoided; hypertensive reactions may occur
Cola tree	May ↑ blood pressure when used with phenelzine and tranylcypromine
Ephedra	Hypertensive crisis can occur when used concurrently; avoid concurrent use
Galanthamine	Hypertensive crisis may occur; avoid concurrent use
Ginkgo	Action may be ↑; avoid concurrent use
Ginseng	May result in manic-like syndrome
Green tea	Large amounts of green tea taken concurrently with MAOIs can cause hypertensive crisis; avoid concurrent use
Guarana	Large amounts of guarana taken with MAOIs can result in hypertensive crisis; avoid concurrent use
Jimsonweed	↑ anticholinergic effects
Khat	↑ action of MAOIs
Night-blooming cereus	May ↑ cardiac effects; avoid concurrent use
Nutmeg	May potentiate MAOIs; avoid concurrent use
Parsley	When used with tricyclics or SSRIs may lead to serotonin syndrome; avoid concurrent use
Poppy	May ↑ the action of MAOIs
Rauwolfia	May cause excitation and/or hypertension; avoid concurrent use
SAM-e	May lead to hypertensive crisis; avoid concurrent use
St. John's wort	May ↑ MAO inhibition; avoid concurrent use
Valerian	May negate therapeutic effects of MAOIs; avoid concurrent use
Methyldopa	
Capsicum	May ↓ the antihypertensive effects of methyldopa; avoid concurrent use
Minerals	
Allspice	May interfere with absorption of minerals; avoid concurrent use
Chitosan	May ↓ the absorption of minerals; space by 2 hours or more
Pipsissewa	Should be taken 2 hours before or after pipsissewa
Morphine	
Oats	May ↓ effect of morphine; avoid concurrent use
Nephrotoxics	
Creatine	May lead to nephrotoxicity
Neuroleptics	
Betel palm	May cause extrapyramidal symptoms; avoid concurrent use
Neuromuscular blockers	
Quinine	May ↑ action of neuromuscular blockers; avoid concurrent use
Nicotine	
Blue cohosh	↑ the effects of nicotine; may cause toxicity; avoid concurrent use
Lobelia	↑ effects of nicotine-containing products; avoid concurrent use
Oats	May ↓ hypertensive effects of nicotine

Continued

Drug/Drug Classes—cont'd

Herb	Interaction
NNRTIs	
Garlic	Garlic with allicin may ↓ the action of NNRTIs
St. John's wort	St. John's wort taken PO with NNRTIs may ↓ the antiretroviral action of the drug
Norepinephrine	
Rauwolfia	May cause ↓ pressor effects; avoid concurrent use
NSAIDs	
Arginine	May cause gastric irritation
Bearberry	May ↑ effect of NSAIDs
Bilberry	May ↑ action of NSAIDs
Bogbean	May ↑ risk of bleeding; avoid concurrent use
Chondroitin	Can cause ↑ bleeding, avoid high doses of chondroitin
Dandelion	May ↑ bleeding when used with NSAIDs
Feverfew	NSAIDs may ↓ action of feverfew
Creatine	May lead to nephrotoxicity
Fenugreek	↑ risk of bleeding when used concurrently with NSAIDs
Garlic	May ↑ bleeding; avoid concurrent use
Gossypol	May result in gastrointestinal distress and gastrointestinal tissue damage
Saw palmetto	May lead to ↑ bleeding time; avoid concurrent use
St. John's wort	May lead to severe photosensitivity; avoid concurrent use
Turmeric	May result in ↑ risk of bleeding; avoid concurrent use
NSAIDs, topical	
Jaborandi	↓ Jaborandi action; avoid concurrent use
Opioids	
Bay	May ↑ the action of opioids; avoid concurrent use
Corkwood	May ↑ anticholinergic effect
Jamaican dogwood	↑ effects of opioids; avoid concurrent use
Lavender	↑ sedation when used with lavender; avoid concurrent use
Meadowsweet	May ↑ the action of opioids
Parsley	May cause serotonin syndrome; avoid concurrent use
Oxytocics	
Ephedra	Causes severe hypertension when used with oxytocics; avoid concurrent use
Paroxetine	
St. John's wort	↑ sedation
Phenothiazines	
Blue cohosh	Metabolism of blue cohosh may be ↓
Coenzyme Q10	Some phenothiazines may ↓ the action of coenzyme Q10 and deplete endogenous stores; avoid concurrent use
Corkwood	May ↑ anticholinergic effect
Ephedra	Tachycardia may result; avoid concurrent use

Drug/Drug Classes—cont'd

Herb	Interaction
Evening primrose oil	May cause seizures; avoid concurrent use
Jimsonweed	↓ action of phenothiazines
Yohimbe	May result in ↑ toxicity; avoid concurrent use
Phenytoin	
Black pepper	With dilantin, black pepper speeds absorption and slows elimination of phenytoin
Valerian	May negate therapeutic effects of medicines containing phenytoin; avoid concurrent use
Plasma, fresh	
Cat's claw	May interact with fresh plasma; avoid concurrent use
Potassium	
Kelp	May lead to hypokalemia
Potassium-wasting drugs	
Aloe	Internal use may ↑ effects of potassium-wasting drugs
Propranolol	
Black pepper	Speeds absorption and ↑ effect of propranolol
Guggul	Can lead to ↑ action of propranolol
Proton pump inhibitors	
Angelica	May ↑ stomach acid, which may ↓ drug action
Beta-carotene	↓ by proton pump inhibitors
Bogbean	↓ effect of proton pump inhibitors
Dandelion	May ↓ the action of proton pump inhibitors
Devil's claw	May ↓ the action of proton pump inhibitors
Male fern	May ↓ the action of male fern, separate by at least 2 hours
Peppermint oil	May cause premature dissolution of enteric-coated peppermint oil
Yarrow	May ↓ the action of proton pump inhibitors
Psychoanaleptic agents	
Cola tree	May ↑ the effects of psychoanaleptic agents
Psychotropic agents	
Nutmeg	May potentiate psychotropic agents; avoid concurrent use
Salicylates	
Arginine	May cause gastric irritation
Blue flag	May ↑ risk of bleeding
Borage	May ↑ risk of bleeding
Chaparral	May ↑ action of salicylates
Chondroitin	Can cause ↑ bleeding; avoid high doses of chondroitin
Cloves	May ↑ effect of salicylates
Cola tree	May ↑ the effect of cola tree products
Dandelion	May ↑ bleeding when used with salicylates
Garlic	May ↑ bleeding; avoid concurrent use
Ginkgo	↑ risk of bleeding; avoid concurrent use

Continued

Drug/Drug Classes—cont'd

Herb	Interaction
Ginseng	May ↓ action of salicylates
Gossypol	May result in tissue damage
Horse chestnut	↑ risk of severe bleeding; avoid concurrent use
Irish moss	↑ risk of bleeding; avoid concurrent use
Pansy	May ↑ actions of salicylates
Rose hips	Can ↓ urinary excretion of salicylates
Scopolamine	
Black root	Forms an insoluble complex with scopolamine; avoid concurrent use
Sedatives/hypnotics	
Black cohosh	May ↑ hypotensive effects; avoid concurrent use
Blue flag	Effects may be ↓
Cowslip	May ↑ the effect of sedatives/hypnotics; avoid concurrent use
Lavender	↑ sedation when used with lavender; avoid concurrent use
Sodium bicarbonate	
Quinine	May lead to toxicity; avoid concurrent use
SSRIs	
Bitter orange	Can inhibit cytochrome P450 3A4 and ↑ drug levels
Ginkgo	Often used to reverse side effects of SSRIs
St. John's wort	Serotonin syndrome and an additive effect may occur; may lead to coma; avoid concurrent use
Yohimbe	May cause ↑ CNS stimulation; avoid concurrent use
Statins	
Goldenseal	May slow the metabolism of statins; avoid concurrent use
Stimulants	
Bogbean	May ↑ effect of stimulants
Ginseng	Overstimulation may occur; avoid concurrent use
Siberian ginseng	Overstimulation may occur; avoid concurrent use
Succinylcholine	
Melatonin	↑ blocking properties of succinylcholine; avoid concurrent use
Sulfonamides	
St. John's wort	May lead to severe photosensitivity; avoid concurrent use
Sulfonylureas	
St. John's wort	May lead to severe photosensitivity; avoid concurrent use
Sumatriptan	
Horehound	↑ serotonin effect; avoid concurrent use
Sympathomimetics	
Ephedra	↑ the effect of sympathomimetics and causes hypertension; avoid concurrent use
Rauwolfia	Will ↑ blood pressure; avoid concurrent use
Yohimbe	May result in ↑ toxicity; avoid concurrent use

Drug/Drug Classes—cont'd

Herb	Interaction
Systemic steroids	
Aloe	Internal use may ↑ effects of systemic steroids
Tamoxifen	
Black cohosh	May augment the antiproliferative properties of tamoxifen
DHEA	Do not take together; DHEA is a potent estrogen agonist
Soy	May interfere with tamoxifen absorption; avoid concurrent use
Tannic acids	
Agar	↑ dehydration; avoid concurrent use
Tetracyclines	
Blue cohosh	May ↑ metabolism, ↓ effect of tetracyclines
Lily of the valley	May lead to cardiac glycoside toxicity
Pectin	Can interfere with absorption of tetracyclines
St. John's wort	May lead to severe photosensitivity; avoid concurrent use
Theophylline	
Black pepper	↑ absorption of theophylline
Cacao tree	May ↓ metabolism of xanthines
Thiazides	
Aloe	Internal use may ↑ effects of thiazides
Thyroid hormones	
Carnitine	May inhibit the effects of thyroid hormone replacement; avoid concurrent use
Guggul	May alter the action of thyroid hormones
Kelpware	May ↓ effects of thyroid hormones; avoid concurrent use
Soy	May interfere with thyroid hormone absorption; avoid concurrent use
Thyroid hormone replacement	
Kelp	May interfere with thyroid hormone
Thyroid preparations	
Agar	Avoid concurrent use because of high iodine content in agar
Bugleweed	Can interfere with the action of thyroid preparations; avoid concurrent use
Thyroid replacement	
Celery	May ↓ the effect of thyroid replacement
Tolbutamide	
Angelica	May delay elimination of tolbutamide; avoid concurrent use
Trazadone	
Ginkgo	May cause coma
St. John's wort	May cause serotonin syndrome
Tricyclic antidepressants	
Coenzyme Q10	Tricyclic antidepressants may ↓ the action of coenzyme Q10 and deplete endogenous stores; avoid concurrent use
Corkwood	May ↑ anticholinergic effect

Continued

Drug/Drug Classes—cont'd

Herb	Interaction
Ephedra	Hypertensive crisis can occur; avoid concurrent use
Jimsonweed	↑ anticholinergic effects when jimsonweed is used with tricyclics
St. John's wort	May cause serotonin syndrome
Yohimbe	May result in ↑ hypertension, doses may need to be ↓
Urinary alkalizers	
Ephedra	↑ the effect of urinary alkalizers
Urine acidifiers	
Bearberry	May inactivate bearberry; avoid concurrent use
Vaccines (passive)	
Cat's claw	May interact with passive vaccines composed of animal sera, avoid concurrent use
Valproic acid	
Carnitine	Valproic acid can induce L-carnitine deficiency
Vitamin B	
Goldenseal	May ↓ absorption of vitamin B
Vitamins, fat-soluble	
Chitosan	May ↓ the absorption of fat-soluble vitamins; space by 2 hours or more
Vitamin K	
Pau D'arco	Use with phytonadione may cause prolongation of pro-time
Warfarin	
Acidophilus	↓ warfarin action
Alfalfa	May ↑ prothrombin time and prolong bleeding
Angelica	May ↑ prothrombin time and prolong bleeding; avoid concurrent use
Anise	May ↑ action of warfarin; avoid concurrent use
Cranberry	May ↑ the INR and ↑ risk of bleeding
Devil's claw	May cause risk of bleeding
Dong quai	May ↑ the effects of warfarin
Valerian	May negate therapeutic effects of warfarin; avoid concurrent use
Xanthines	
Cacao tree	May ↓ the metabolism and thereby ↑ levels of xanthines such as theophylline; avoid concurrent use
Coffee	Large amounts of coffee ↑ the action of xanthines such as theophylline
Cola tree	May ↑ the action of xanthines; avoid concurrent use
Ephedra	Causes ↑ central nervous system stimulation; avoid concurrent use
Green tea	Large amounts of green tea ↑ the action of xanthines
Guarana	May ↑ pulse rate, blood pressure, and arrhythmias; avoid concurrent use
Siberian ginseng	Overstimulation may occur; avoid concurrent use

Drug/Drug Classes—cont'd

Herb	Interaction
Zinc	
Black catechu	Form an insoluble complex; avoid concurrent use
Chromium	↓ chromium absorption when taken concurrently
Melatonin	↑ inhibition of NMDA receptors; avoid concurrent use
Sorrel	May ↓ zinc absorption
Yellow dock	Tea may ↓ the absorption of zinc

APPENDIX C
Pediatric Herbal Use

General Precautions

Because childproof packaging is not required for herbs, be sure to store them out of children's reach.

Although herbs have commonly been combined for use, the synergistic effects of multiple herbs—potentially positive as well as negative—are only beginning to be studied (Williamson, 2001; Goldman, 2008).

Use of alternative and complementary therapies in children and adolescents is increasing. Be sure to inquire specifically about herb and supplement ingestion when caring for children (Gardiner, 2004; Trigazis, 2004; Martel, 2005; Shakeel, 2007; Post-White, 2009).

Dosage Guidelines

Start with the lowest dose in the range and work up. Frequency and consistency: 1 large dose per day is not as effective as 3-4 small doses.

Tea Dosage Guidelines*

Age of Child	Dosage
<1 yrs	1 tsp daily, working up to 1 tsp tid
1-2 yrs	1 oz-¼ cup daily, working up to ¼ cup tid
3-6 yrs	¼-½ cup daily, working up to tid
7-11 yrs	Up to 6 oz daily, working up to tid-qid
12 yrs-adult	1 cup daily, working up to tid-qid

*(Kemper, 1996; White, 1998; Scott, 2003)

How to Make Herbal Teas

(Kemper, 1996; Scott, 2003; White, 1998, Romm, 2003; McIntyre, 2005)

- 1 cup boiling water
- 1 tsp *dried* **or** 2-3 tsp *fresh* leaves, stems, or flowers

Steep together 3-5 min in a covered pot; strain; serve the liquid tea when temperature is appropriate.

Tincture Dosage Guidelines*

Age of Child	Dosage
≤2 yrs	Not recommended for use
3-6 yrs	2-10 drops in ¼ cup water daily, working up to tid
7-11 yrs	10-20 drops in 6 oz water daily, working up to tid-qid
12 yrs-adult	20-50 drops up to tid-qid

*(White, 1998; Scott, 2003)

How to Make Herbal Decoctions

(Kemper, 1996; Scott, 2003; White, 1998; McIntyre, 2005)

- 2 tsp *dried* herb **or** up to 6 tsp *fresh* herb
- 2 cups water

Combine and simmer gently 5-15 min; strain; cool before serving the liquid. Decoction dose guidelines are listed with each herb.

Acidophilus

Uses

Prevention of diarrhea and stunted growth (Saran, 2002) after antibiotics or antimicrobial herbs, treatment of oral thrush through competitive inhibition, colic (Gladstar, 2001), treatment of diarrhea (Elmer, 2001; Gaon, 2003; Fox, 2004; Salazar-Lindo, 2007)

Precautions

Be sure no lactose intolerance or allergy exists before prescribing yogurt. Do not give in the presence of high fever.

Dosage/Administration

- Acidophilus supplements: follow directions on product label (Zand, 2003)
- Yogurt with live active cultures: use topically after each feeding in infants
- ¼ tsp 4-5 times/day for colic (Gladstar, 2001)
- Diarrhea prevention (Chou, 2004; Fox, 2004): 50 ml curd containing *Lactobacillus acidophilus* daily (Saran 2002)
- For *Clostridium difficile*: PO 5-10 billion live *Lactobacillus* GG in rehydrating solution

Aloe

Uses

Topical treatment of minor burns, sunburn, cuts, abrasions, insect bites, acne, poison ivy, frostbite, itching of chicken pox (Vessey, 2001). Not recommended for internal use in children. Decreased bowel transit time reduces absorption of other medications (Gardiner, 2000).

Research/Future Possibilities

Changes in chemical composition of urine after aloe gel consumption show potential for preventing kidney-stone formation among children (Kirdpon, 2006).

Precautions

For external use only in children $<$12 yrs

Dosage/Administration

- Topical: break off leaf, split lengthwise, apply gel to affected skin (White, 1998)

Angelica Archangelica

Uses

Relaxing expectorant, diaphoretic, carminative, diuretic

Precautions

Avoid during pregnancy.

Dosage/Administration

- Tea: Simmer 1 tablespoon of root pieces in 2 cups of boiling water for 15 minutes. Cover while simmering. Take 1 tablespoon to ½ cup up to every 4 hours. (Romm, 2003)
- Tincture: 10-40 drops up to every 4 hours. (Romm, 2003)

Anise

Uses

Cough, expectorant, colic

Research

Anise oil exhibited a high level of antiviral activity against acyclovir-sensitive herpes simplex virus type 1 (Koch, 2008).

Precautions

Do not give the essential oil to children.

Dosage/Administration

- Decoct 1 tsp seed in 1 cup water; strain and serve several times/day. (White, 1998)
- Tea: PO: ½-3 cups daily (Romm, 2003)
- Tincture: 5 drops up to 4 times in 1 hour for colic; ¼-½ tsp up to every 4 hours (Romm, 2003)

Astragalus

Uses

Immune system support

Precautions

Do not use during fevers; use only *Astragalus membranaceus* sp.; do not use wild species of American astragalus.

Dosage/Administration

- Capsules/extract: follow package directions
- Cooked: drop 1 stick of herb into cooking pot when making soup or cooked grains
- Tea: use 1 stick of herb decocted in 1 cup water (White, 1998); see tea dosage guidelines
- Tincture: ½-1 tsp 2-3 times/day (Romm, 2003)

Barberry

Uses

Nausea, diarrhea, mucous conditions such as coughs

Precautions

At first, barberry increases the amount of mucus being expelled, so start with small doses; do not take for more than 10 days at a time because extended consumption may decrease B-vitamin absorption and utilization; do not give barberry if the child has high blood pressure.

Dosage/Administration

- Extract (strength of 1:1): use ⅛ tsp in 4 oz water, sipped slowly over an hour (Kemper, 1996)
- Tincture (strength of 1:5): use 2-3 drops in 4 oz water, sipped slowly over an hour (Kemper, 1996)

Benzoin

Uses

Topically as an antiseptic; as an inhalant and expectorant for bronchial disorders

Precautions

Allergy to benzoin can develop and cross-react with Mastisol; discontinue use if any hypersensitivity reactions occur (James, 1984).

Dosage/Administration

- Inhalant: 5 ml benzoin gum/1 pt water; breathe vapors
- Topical: apply to affected area every 2-4 hrs; test a small area before applying to larger one

Black Haw

Uses

Relieves muscle cramps or spasms, including irritable bladder muscles; menstrual pain

Precautions

Do not use if history of kidney stones or kidney disease

Dosage/Administration

- Capsule/decoction: for a 50-lb child (age approx 7 yrs) use ½ capsule or ½ cup decoction up to qid (White, 1998)
- Cream: apply topically to relieve muscle cramps (Ody, 1993)
- Tea: see tea dosage guidelines (White, 1998)

Boneset

Uses

Colds and flu, to promote sweating, expectorant, antispasmodic

Precautions

High doses can cause vomiting; not for children <1 yr; do not administer for longer than 7 days; can cause contact dermatitis in those hypersensitive to Asteraceae (Brinker, 1998)

Dosage/Administration

- Tea: ¾ cup for 40-lb child, tid up to 3 days; adjust quantity by weight of child; better too little than too much (White, 1998); see tea dosage guidelines

Burdock

Uses

Skin irritations, eczema, psoriasis

Precautions

Insulin dose may need to be adjusted because of hypoglycemic effect of burdock (Brinker, 1998); commercial sample may be adulterated with belladonna; do not give for longer than 2 wks; take a 1-wk break after a 2-wk regimen.

Dosage/Administration

- Capsule/tea: 1 capsule/day or 1 cup tea /day for a 50-lb child (White, 1998); see tea dosage guidelines
- Tincture: ¼-½ tsp up to 4 times/day (Romm, 2003)

Catnip

Uses

Colic, relaxes spasms and cramps, clears flatulence, sleeplessness, minor fevers

Precautions

None known when using a reasonable amount (Vessey, 2001); there is a potential additive effect with drugs that sedate, such as anticonvulsants, antianxiety medications, and tricyclic antidepressants (Harkness, 2001).

Dosage/Administration

- Tea (internal): nursing mothers can take adult dose to ease baby's colic; a few oz daily for infants—can give in dropper alongside nipple—or 1 fluid oz before each feeding (McIntyre, 2005); 1 cup daily for toddlers; see tea dosage guidelines for older children (White, 1998)
- Tincture: 10-30 drops up to 4 times/day (Romm, 2003)

Chamomile

Uses

Anxiety, teething, upset stomach, muscle and digestive spasms, nausea, colic

Research

Although the study had a very small sample size, the authors found that chamomile (specifically, *Matricaria chamomilla*) improved some symptoms of attention-deficit hyperactivity disorder (Niederhofer, 2008).

Chamomile oil was highly active against clinically relevant acyclovir-resistant herpes simplex virus, type 1 strains (Koch, 2008).

An apple pectin-chamomile extract shortened the course of diarrhea in children (Becker, 2006).

Precautions

Avoid if allergic to daisy family (Asteraceae), including ragweed; anaphylaxis to chamomile is well known (Subiza, 1989; Reider, 2000); to avoid contamination, use only commercial preparations.

NOTE: Filling up infant on tea leaves less room for milk. *Do not substitute tea for milk or formula!*

Dosage/Administration (Balch, 2002; Kemper, 1996; Scott, 2003; White, 1998)

- Capsule: ½ capsule tid for 50-lb child
- Tincture: follow package directions or 10-30 drops, up to qid (Romm, 2003)
- Tea: infant: 1-3 tsp/day; toddler: ½ cup/day; 50-lb child: 1 cup tea or 1 dropperful extract/day
- Tea: colic: start slowly at 1 oz/day; watch for side effects before increasing to 3-4 oz/day
- Topically as a wash or salve

Dandelion

Uses

Internal: diuretic (bladder irritations), mild laxative, increases bile secretion (liver disorders) External: warts (White, 1998), acne

Precautions

Do not use in children with acute gall bladder problems. Do not give to children allergic to the Asteraceae (formerly called Compositae) species (such as chamomile, yarrow root).

Dosage/Administration

Fresh greens as a vegetable in season, can be steamed, or steamed and marinated

- Root tea: ¼-1 cup daily or as a skin wash for acne (Romm, 2000)
- Tincture: 10-15 drops 2-3 times daily (Romm, 2003)
- Dandelion juice for warts: squeeze white juice from stems directly on wart several times/day for several weeks (White, 1998; McIntyre, 2005)

Echinacea

Uses

Immune system support, childhood fevers, respiratory tract infections (Cohen, 2004), colds (refuted by Barrett, 2004, although echinacea decreased the risk of subsequent colds [Weber, 2005]), flu, sore throats and coughs; externally for wounds, eczema, chicken pox/herpes

Research

Echinacea tincture stimulated T cells within 24 hours of ingestion (Brush, 2006).

Precautions

Not for use during immune disorders such as lupus, tuberculosis, multiple sclerosis, or HIV infection (Brinker, 1998; Vessey, 2001); rarely, patients with asthma, eczema, or hay fever have shown allergic reactions; not for children with allergy to daisy family (Asteraceae); limit use to 10 days at a time, then take a 5-day break; for eczema (external use), take only a 2-day break. Do not give to children younger than 2 years of age.

Dosage/Administration

- Capsule/glycerite/tincture: 50-lb child: 1 dropperful glycerite or tincture; 1 capsule (White, 1998)
- Tincture: ½ tsp bid to prevent colds and infections; for acute infections ½-1 tsp as often as every 2 hours (Romm, 2000); range from 1 drop/ 5 lbs body weight to 1 drop/ 1 lb body weight, depending on the condition's severity (Romm, 2003)
- For acute infections, ¼-½ tsp. every 2 hours; for chronic infections, 3 times/day (McIntyre, 2005)
- For skin infections, make a topical tincture of 1 teaspoon per ¼ cup water to use as a rinse (Romm, 2003)
- Tea: See tea dosage guidelines

Elderberry

Uses

Fevers, stimulate the immune system, antiviral, flu, infections, asthma

Precautions

Use only blue-black elderberries; the red ones are toxic. Do NOT ingest the stem because of its cyanide content; do not use the leaves, roots, or bark internally. Only use cooked berries. Uncooked berries can cause nausea and vomiting. Large doses of elderberry juice can cause diarrhea.

Dosage/Administration

- Tea: ½-1 cup up to qid, taken hot.
- Prepared Syrup: 1-2 tablespoons/day or 1-2 tsp up to tid.

To make syrup, use 1 cup fresh *or* ½ cup dried elderberries, 3 cups water and 1 cup honey. Boil the berries in water, reduce heat and simmer 30-45 minutes. Smash the berries, strain them and add the honey to the strained liquid. Bottle and store in the refrigerator up to 2-3 months (Gladstar, 2001).

- Tincture: ¼-1 tsp up to 3 times/day (Romm, 2003)

Eucalyptus

Uses

Decongestant for coughs and chest infections

Precautions

Essential oil is *not* for internal use (Burkhard, 1999); internal use may cause seizures (Gouin, 1996); child must be 2 yrs of age to use eucalyptus; do *not* apply to face of small children (Basch, 2005); not for patients with liver, gallbladder, or digestive diseases. Topical poisoning, although rare, has been reported (Darben, 1998)

Dosage/Administration

- Chest rub: dilute 0.5-2 ml eucalyptus oil in 25 ml almond oil (Ody, 1993); apply to chest or 1 drop per 5 ml sesame oil (McIntyre, 2005)

Evening Primrose Oil

Uses

Eczema and atopic dermatitis (Yoon, 2002; Senapati, 2008), PMS, mastalgia, ADHD (Vessey, 2001), ADHD with borderline zinc deficiency (Arnold, 2000)

Precautions

May trigger temporal lobe epilepsy, especially in schizophrenics receiving phenothiazines; side effects include nausea, stomach pain, and headache. Do not give to children who have a seizure disorder.

Dosage/Administration

- Eczema: 1-2 g/day from capsules (Ody, 1993), but not greater than 0.5 g/kg body weight daily (Basch, 2005)
- Mastalgia: 3-4 g/day (1 g tid-qid) from capsules (Integrative Medicine, 2000)
- PMS: 3 g/day (1 g tid) from capsules (Integrative Medicine, 2000)

Fennel

Uses

Upset stomach, gas, colic, cramps from diarrhea, to promote milk flow in nursing mothers

Precautions

Large doses may cause nausea, vomiting, and skin irritation; essential oil is *not* for infants or small children (Burkhard, 1999; Brinker, 1998). Long-term use may cause premature thelarche in children younger than 2 years (Türkyilmaz, 2008). Food allergy has been reported, although it is rare (Moneret-Vautrin, 2002; Mills, 2005).

NOTE: Filling up infant on tea leaves less room for milk. *Do not substitute tea for milk or formula*!

Dosage/Administration

- Infant colic: 3-4 oz tea/day (Kemper, 1996)
- Other conditions: See tea dosage guidelines

Garlic

Uses

Respiratory infections, ear infections

Research/Future Possibilities

Garlic may increase oxygenation and improve dyspnea in children with hepatopulmonary syndrome (Najafi Sani, 2006). Garlic cloves have been used to eliminate warts, but caution is advised to avoid contact dermatitis (Silverberg, 2002). Constituents in garlic exhibit anticancer actions (Powolny, 2008).

Precautions

Large quantities can irritate mouth or stomach (Brinker, 1998); use sparingly for children younger than 2 years of age. May interact with drugs used to alter platelet function and coagulation (Tomassoni, 2001; Harkness, 2000).

CAUTION: Topical application can result in garlic skin burns (Parish, 1987; Rafaat, 2000).

Dosage/Administration

- Cooked: children can eat rice or other foods flavored with garlic or can eat ½-3 cloves daily
- Garlic oil: a 50-lb child can take ½ capsule garlic oil several times a day with food (White, 1998)
- Tea: see tea dosage guidelines; up to 4 cups daily can be used during colds
- Syrup: ½-1 tsp/day (Romm, 2003)
- Supplements: per package dosages

NOTE: Nurslings spent more time at the breast when mothers who didn't usually consume garlic did so (Menella, 1993)

Ginger

Uses

Nausea, motion sickness, vomiting (Langner, 1998; Quimby, 2007), digestive cramping, stomach upsets, muscle aches, menstrual cramps, headaches

Research

Helicobacter pylori, recognized as a primary etiologic factor in the development of gastritis and peptic ulcer disease, was susceptible in vitro to methanol extract of ginger (Mahady, 2005).

Precautions

Do not use during childhood fevers or in children with gallstones; in large doses over long periods, ginger can cause inflammation and weakness. Although a theoretical additive effect to warfarin has not been investigated in humans, it may be best to avoid this combination.

Dosage/Administration

- Fresh herb/extract/capsule: grate fresh ginger into teas or follow package directions for extract or capsule (White, 1998)
- Ginger root: <3 yrs: 25 mg qid; 3-6 yrs: 50-75 mg qid; 7-11 yrs: 125 mg qid; ≤12 yrs: 250 mg qid (Kemper, 1996)
- Tea: 2 slices ginger in 1 cup water (Kemper, 1996); see tea dosage guidelines
- Tincture: 5-25 drops in water up to 4 times/day (Romm, 2003)

Hops

Uses

Restlessness, hyperactivity, insomnia, headaches, pain

Research/Future Possibilities

See lemon balm.

Precautions

Not for those with estrogen-dependent disorders; not appropriate in children with bedwetting, lethargy, or depression; not for long-term use; may cause skin irritation. There is a potential additive effect with drugs that sedate, such as anticonvulsants, antianxiety medications, and tricyclic antidepressants (Harkness, 2001).

Dosage/Administration

- Bath: add a few drops of oil or dried herbs in a stocking to bath water (Kemper, 1996)
- Tea: See tea dosage guidelines

Hyssop

Uses

Coughing, colds and flu, chronic phlegm

Research/Future Possibilities

Muscle-relaxing activity of the essential oil has been shown on guinea pig and rabbit intestine (Lu, 2002)

Precautions

Do not give to children <2 yrs of age; use essential oil in very small quantities only for children.

Dosage/Administration

- Tea: can be combined with lemongrass and elderberry as tea to treat childhood fevers (White, 1998); see tea dosage guidelines

Juniper

Uses

Diuretic, upset stomach, menstrual pain, urinary tract infection

Precautions

Do not give to children <2 yrs of age; contraindicated for those with kidney infection and inflammation (Brinker, 1998); do not use longer than 4 wks because of potential kidney damage.

Dosage/Administration

- Menstrual pain: use a weak tea of 15 g berries in 500 ml water (Ody, 1993)
- Urinary tract infection: PO berry juice: dilute in water
- Other conditions: see tea dosage guidelines

Lemon Balm

Uses

Nervousness, anxiety, hyperactivity, sleep disorders (Müller, 2006), irritability, tension, antiviral

Research/Future Possibilities

Administration of lemon balm quelled laboratory-induced stress (Kennedy, 2004). Lemon balm essential oil affected the infectivity of enveloped herpesviruses (Schnitzler, 2008); an extract of lemon balm leaves inhibited replication of herpes simlex virus type 2 (Mazzanti, 2008).

Precautions

There is a potential additive effect with drugs that sedate, such as anticonvulsants, antianxiety medications, and tricyclic antidepressants (Harkness, 2001).

Dosage/Administration

- Tea
  - Infants ¼ cup tid
  - Young children up to 50 lbs: up to 5 oz tid
  - Older children: 1-3 cups/day

- Tincture: ¼-1 tsp as needed (Romm, 2003)
- Cream: topically as needed
- Massage oil: dilute 2-3 drops per tablespoon of carrier oil
- Add a strong infusion to a warm bath (McIntyre, 2005)

Lemongrass

Uses

Childhood fevers

Precautions

None identified

Dosage/Administration

- Tea: use in tea with hyssop and elderberry (White, 1998); see tea dosage guidelines

Licorice

Uses

Clears mucus from chest and upper respiratory tract, soothes inflammation in digestive tract and lungs

Precautions

Avoid licorice if the child has high blood pressure or adrenal disease (Romm, 2003).

Dosage/Administration

- Tincture: 2 to 20 drops up to 4 times daily (Scott, 2003). Start with the lowest dose; if not sufficient, it may be increased.
- Decoction and infusion: ⅓ of a teacup. To make a licorice decoction, add 1 tablespoon of chopped licorice to 2 cups of boiling water for 20-30 minutes (Romm, 2003).

Lobelia

Uses

Expectorant, coughs, asthma

Precautions

Do not administer during shock or nervous prostration, low blood pressure or paralysis, or with dyspnea from heart disease (Brinker, 1998); small quantities may cause slight nausea or a tight sensation in throat; give to children ≤5 yrs of age only; expect expectoration! Do not use large doses.

Dosage/Administration

- Tea: infuse no more than ¼ tsp dried herb/1 cup hot water; a 50-lb child can drink up to 1 cup tid (White, 1998); see tea dosage guidelines

Nettle

Uses

Allergies, hay fever, colds, coughs

Precautions

Do not give to children <2 yrs of age; do not give to those with severe allergies, especially during anaphylactic shock; excessive use may interfere with these drugs: hypoglycemics, hyperglycemics, antidiabetics, and central nervous system depressants. Contact dermatitis can occur with fresh leaf (McIntyre).

Dosage/Administration

- Capsule/tea: a 50-lb child can have ½ capsule/day or ½ cup tea/day to begin, increasing to tid during allergy season (White, 1998); 2 "00" size capsules 2 or 3 times daily (Romm, 2003); see tea dosage guidelines
- Tincture: ¼-½ tsp up to 4 times/day (Romm, 2003)
- Cooked: can serve as steamed fresh greens, but be careful of the nettles; use gloves when gathering and preparing

Plantain

Uses

Externally for bee stings, poison oak or ivy rash, chicken pox, scrapes; internally for urinary tract inflammation, respiratory inflammation, or chronic cough (Wegener, 1999)

Precautions

Internal use may cause nausea, vomiting, anorexia, flatus, diarrhea, bloating, or obstruction.

Dosage/Administration

- Tea (internal): for urinary or lung disorders, make a tea of ½ tsp dried herb; administer as often as q2h (Scott, 2003)
- Topical: apply fresh poultice of leaves, or apply leaves directly

Tea Tree Oil

Uses

Acne, athlete's foot

Research/Future Possibilities

Formulations containing tea tree oil were more active than soft soap as a hygienic skin wash against *Escherichia coli* (Messager, 2005). Application of 100% tea tree oil may have therapeutic benefit in nickel-induced contact hypersensitivity in human skin (Pearce, 2005). Tea tree oil has been used successfully to treat warts in a pediatric patient (Millar, 2008).

Precautions

Oil may burn if it gets into eyes, nose, mouth, or tender areas. *Do not give internally*. Do not give to individuals allergic to celery or thyme because they share a potential allergen.

Dosage/Administration

- Dilute for use in small children: 1-2 drops per teaspoon of carrier oil, such as almond or olive (White, 1998)
- 5% oil gel was used effectively on acne (Fugh-Berman, 2002)

Thyme

Uses

Antiinflammatory, coughs, bronchitis, upper respiratory mucus, sore throats, colic

Research/Future Possibilities

Thyme's essential oil has mosquito-repellent activity for hairless mice (Choi, 2002). Antifungal activity of the essential oil has been established (Pina-Vaz, 2004). Essential oils exhibit antibacterial/antimicrobial activity (Fabio, 2007).

Precautions

Never use essential oil internally or near eyes, nose, mouth (Mills, 2005) or sensitive mucous membranes (Romm, 2000). In large doses can cause diarrhea. One case of allergy has been reported (Benito, 1996); cross reaction occurred within the Lamiaceae family, which includes Hyssop.

Dosage/Administration

- Bath: for infants, add strained tea to bath water (Scott, 2003)
- Chest rub: add 10 drops thyme oil diluted in 20 ml almond or sunflower oil (Ody, 1993); or 5-10 drops diluted with 2 tablespoons almond oil for topical application (Romm, 2000)
- Tea: see tea dosage guidelines or use ¼-1 cup up to tid
- Tincture: 10 drops to ½ tsp up to tid

Valerian

Uses

Insomnia, dyssomnia (Müller, 2006), anxiety, hyperactivity (Berdonces, 2001), attention-deficit hyperactivity disorder (Vessey, 2001), muscle or digestive cramps, flatulence, sleep difficulties in children with intellectual deficits (Francis, 2002)

Precautions

For some children, valerian can have a slight simulating effect—discontinue if this occurs (Gladstar, 2001). Withdrawal syndrome can occur after long-term use (Tomassoni, 2001); can be mentally habit forming; in large doses (>100 g daily) can cause muscle pain and heart palpitations; may be toxic to liver when used for an extended period. There is a potential additive effect with drugs that sedate, such as anticonvulsants, antianxiety medications, and tricyclic antidepressants. (Harkness, 2001)

Dosage/Administration

- Capsules: Follow package directions
- Tea/tincture: See dosage guidelines

Yarrow

Uses

Externally for inflammatory skin conditions such as chicken pox, poison ivy and oak rashes; internally for fever, colds, and flu (McIntyre, 2005)

Research

Yarrow's antioxidant and antiinflammatory effects have been confirmed (Nemeth, 2008). The extract of yarrow exhibits a hepatoprotective effect, which may be partly attributed to its observed calcium channel blocking activity (Yaeesh, 2006).

Precautions

Contraindicated for children allergic to daisy family (Asteraceae) (Brinker, 1998).

Dosage/Administration

- Tea: See tea dosage guidelines

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APPENDIX D
Abbreviations

ac before meals
AIDS acquired immunodeficiency syndrome
ALT alanine aminotransferase
AST aspartate aminotransferase (SGOT)
bid 2 times daily
BUN blood urea nitrogen
CBC complete blood cell count
CMV cytomegalovirus
CNS central nervous system
DHEA dehydroepiandrosterone
ECG electrocardiogram
er extended release
gal gallon
GERD gastroesophageal reflux disease
GLA gamma linolenic acid
HIV human immunodeficiency virus
I&O intake and output
IgA immunoglobulin A
IgG immunoglobulin G
IgM immunoglobulin M
in inch
IV intravenous
MAOI monoamine oxidase inhibitor
mo month
NMDA N-methyl-D-aspartate
NNRTI nonnucleoside reverse transcriptase inhibitor
NSAID nonsteroidal antiinflammatory drug
OTC over the counter
PA pyrrolizidine alkaloid
pc after meals
PMS premenstrual syndrome
PO by mouth
pp postprandial (following a meal)
prn as required
PT prothrombin time
q every
q2hr every 2 hours
q3hr every 3 hours
q4hr every 4 hours
q6hr every 6 hours
q12hr every 12 hours
qAM every morning
qd-bid 1-2 times daily
qhr every hour
qid 4 times daily
qPM every night
qs sufficient quantity
SLE systemic lupus erythematosus
SSRI selective serotonin reuptake inhibitors
tbsp tablespoon
tid 3 times daily
tid-qid 3-4 times daily
tsp teaspoon
wk week

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GLOSSARY

Aril: A botanical term used to denote an accessory seed coating that may form a fleshy, cuplike structure around the immature seed (ovule), as in yew and nutmeg. The aril is often brightly colored and edible.

Binomial: The unique, two-part scientific name used to identify a plant. The first name is the genus; the second, the species. A designation of the variety may also follow to further differentiate the plant. Because common names differ from region to region and a single common name may often denote several herbs that differ widely from each other, use of the binomial is the only reliable way to accurately specify a particular herb.

Concentration: A means of expressing the amount of herb and solvent used in formulating an herbal preparation. For example, a tincture with a 1:5 concentration contains 1 part of the herb in grams to 5 parts of the solvent in milliliters. Concentration is not the same thing as potency (see Potency).

Crude herb: The raw plant, before it is dried and processed.

Decoction: A liquid preparation made by boiling plant parts (such as bark, roots, or rhizome) in water.

Extract: A concentrated form of the herb that is derived when the crude herb is mixed with water, alcohol, or another solvent and distilled or evaporated. Extracts may be either fluid or solid.

Gall: A lump or ball that forms most often on the stems, leaves, or roots of plants at the sites of injuries caused by insects, fungi, bacteria, or other organisms. An example is the oak gall, which contains tannin.

Herb: A plant that is used for its medicinal purposes. (This differs from the biological definition of an herb as a plant with no woody above-ground parts.)

Infusion: A liquid preparation made by pouring water over plant parts (such as dried or fresh leaves, flowers, or fruits) and allowing the mixture to steep. Hot water (below the boiling point) is usually used, but cold water may also be used. Making a cup of herbal tea is an example.

Minim: A fluid measure constituting 1/60 of a fluidrachm, which itself is about a teaspoonful (1/8 of a fluid ounce). A minim is about the equivalent of one drop of water.

Nutraceutical: A food that is used for its medicinal properties.

Oil, essential: The aromatic volatile oils extracted from various parts of the fresh herb. Essential oils are usually diluted before being used therapeutically.

Oil, infused: A mixture composed of the volatile oils of an herb and another oil. The so-called "carrier oil" is used to extract the volatile oils by soaking plant parts in it for a specified period.

Pharmacognosy: The study of chemicals taken from natural sources to be used as drugs or in the preparation of drugs. Sources may include plants, animals, or other life forms such as fungi, molds, and yeasts.

Phytochemical: The active chemical components, or constituents, present in a plant that account for its medicinal properties.

Phytomedicine: The use of plants, plant parts, and preparations made from them to prevent, treat, or cure various health conditions.

Potency: A measure of the strength of the active chemical components contained in an herb or herbal preparation. Standardized products ensure that the consumer receives a dosage containing a consistent potency.

Poultice: Plant material (such as crushed fresh herbs) that has been wrapped in gauze or similar soft cloth, moistened, and applied topically.

Powder: The dried product of an extraction process during which the herb is distilled, using a solvent such as alcohol or water, after which the solvent is completely removed. The dry solid that remains either is already in powder form or may be ground into it.

Rhizome: An underground plant stem, growing more or less horizontally, that usually has roots on its underside and bears buds.

Tincture: A plant extract made by soaking herbs in a liquid (such as water, alcohol, vinegar, or glycerine) for a specified period, then straining and discarding the plant material. The remaining liquid is used therapeutically. Tinctures typically are made at a concentration of 1:5 to 1:10.

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Pregnancy Categories

Category 1	No proven increase in the frequency of malformation or other harmful effects on the fetus despite consumption by a large number of women.
Category 2	No increase in frequency of malformation or other harmful effects on the fetus from limited use in women. No evidence of increased fetal damage in animal studies.
Category 3	No increase in frequency of malformation or other harmful effects on the fetus from limited use in women. Animal studies are lacking.
Category 4	No increase in frequency of malformation or other harmful effects on the fetus from limited use in women. Evidence of increased fetal damage in animal studies exists, although the relevance to humans in unknown.
Category 5	Has caused or is associated with a substantial risk of causing harmful effects on the fetus or neonate without causing malformations. These effects may be reversible.
Category 6	Has caused or is associated with a substantial risk of causing fetal malformation or irreversible damage.
Category 7	High risk of damage to the fetus.

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